Santa Clara River
Enhancement and Management Plan Study

A History of the Santa Clara River

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April 1995

Summary

This document presents an overview of the historical changes that have shaped the Santa Clara River and its surrounding environment. Three chronological areas are examined. First, the Agrarian Era (1782-1870s) documents the indigenous populations and the arrival of Spanish and Mexican settlers and their interactions with the river. Second, the Commercial Era (1870-1920) describes the intensification of settlement and agriculture in the Santa Clara River valley and the rising competition for use of water. The final section, the Industrial Era (1920-present) demonstrates the rise of conflicting interests, including agriculture, commerce, development and government.

Sources include a wide variety of published accounts, government documents, maps, photographs, and anecdotal information from interviews and other narratives. These sources do not always present a consistent picture of the river, but their inconsistencies are often revealing and noted as such. Scientific records often present data sets that cannot be compared over time due to changing scientific techniques and goals. Because of the wide variety of source material and changing definitions of the river itself, it was impossible to confine the historical study to a particular area such as the river channel or 500 year floodplain. Although many of the events and shifts chronicled in this report affected areas adjacent to the river and not just its floodplain, the historical trends noted here were significant in the natural history of the river. Shifts in agriculture, for example, often began to affect the Santa Clara River valley as a whole earlier than they affected the riverbed in terms of planting, but increased water demands for crops like citrus did have a direct impact on the Santa Clara River itself. Thus, not all the events noted took place directly "in" the river, but they are relevant to the history of the river.

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Section 1

The River and the Agrarian Era (1782 - 1870s)

Historical Overview

The Santa Clara River, typical of Southern and Central California coastal drainages, cuts through a variety of climate zones (*Sunset* 1979), flows intermittently, has a broad sandy bed and shallow depth, and is subject to annual flooding. Humans, birds and plants have incorporated these characteristics into their lifeways differently over time. The first groups of humans to interact with the river involved themselves in trade, small scale agriculture and livestock raising until the 1870s.

The indigenous Chumash and Tataviam people traded food, pelts and plant material for clothing and basketry from their living sites along the river, and from Shisholop, a large Chumash village which may have been a provincial capital, about three miles north of the mouth of the river.

The first major contact with Europeans occurred in 1782 with the establishment of San Buenaventura Mission by Spanish priests. The mission developed land along the Santa Clara River, and most of the local population became involved with the mission's plan for self sufficiency through the raising of crops and livestock.

From the 1820s to the 1860s livestock raising on large ranchos became the dominant occupation along the river. The new Mexican government granted parcels of land to aspiring ranchers. Ranchos adjacent to the river such as San Miguel, San Pedro, Rio de Santa Clara, Santa Clara del Norte, Santa Paula Y Saticoy, Sespe, and San Francisco supported growing populations of cattle and sheep. The hide and tallow trade followed by a demand for meat from the gold miners in the Sierras fueled this demand for livestock. Grazing and watering of livestock and limited irrigation shaped land use adjacent to the Santa Clara River in this period.

This system began to be challenged with the advent of American ownership of the land in 1848. However, ranchers retained much of their pastoral lifeway until the early 1860s when a decline in demand for cattle coupled with natural disasters economically stripped most of them. Gradually land use around the river shifted from ranching to agriculture.

Physical Setting

Natural History

In 1769 Father Juan Crespi recorded his observations of the Santa Clara River from Castaic Creek east to Santa Paula. His notes are consistent with our current day notions of a fully functioning riparian system. Near Castaic he observed vegetation which indicated a consistent source of water. He wrote about "tall and thick cottonwoods and oaks," and an "arroyo with a great deal of water which runs in a moderately wide valley, well grown with willows and cottonwoods." As he moved toward Camulos rancho he saw a "good stream of water ... [its] banks well-grown with cottonwoods, live oaks, and willows.... plenty of grass." He remarked about the alkaline soil of the area, "[The] earth was very spongy; insecure and whitish, [and the arroyo flowing with plenty of water [sunk] into [the] sand." Near Fillmore he commented that the "road [was] broken by arroyos and gullies formed by the floods from the mountain ridges... [We] stopped by one of [the arroyos] which had plenty of water." As Crespi's party approached Santa Paula he estimated the width of the arroyo, which he "would call at this point a river," at "fifty varas of sand and about eighteen varas of running water" (Crespi/Bolton 1927). A vara is roughly equivalent to a yard.

In the mid-1850s the United States government commissioned surveys of the region to ascertain the best route for a railroad. Members of these parties also noted indicators of a riparian system. At the east end of the river moving towards San Francisquito Creek, the party had difficulty traveling due to the denseness of the vegetation in the riverbed: "... the growth of timber and willows along the creek, ... filled the whole valley between the ridges on either side ... we were obliged to cut our way out through the thickets and form a road for the wagon." Another member of the party observed a Black-shouldered hawk (*Elanus leucurus*) "hovering over a freshwater marsh" in the same region. This surveying group also found and named the Unarmored Threespine Stickleback (*Gastersteus williamsoni*) near the eastern headwaters of the river, which they called Williamson's Pass (U.S. War Department vol. 7, parts 1, 3 and 4, 1857) Table 1-1 on the following page lists plant species found in the area.

Table 1-1

Plant Species Noted Near "San Buenaventura and the Valley of the Santa Clara River, 1853

n.b. Taxonomic names change over time. Those listed below may not correspond with current designations.

Sisymbrium deflexum
Sinapsis arvensis
Isomeris arborea
Viola peduncula
Polygala cucullata
Oenothera cheiranthifolia
Lithophragma cymbalaria
Peucedanum utriculatum
Gilia micrantha
Gilia inconspicua
Gilia californica
Eriogonum polifolium
Avena fatua
Sidalcea malvaflora var. *humilis*
Solanum umbelliferum var.*trachycladium*

Sources U.S. War Department vol. 7, parts 1, 3 and 4, 1857.

Floods

While official precipitation records do not exist for the early part of the river's history, various historians have been able to use mission crop records to indicate seasonal rainfall patterns. In 1931, H.B. Lynch calculated average rainfall from 1769 to the twentieth century. Vern Freeman (1968) used these estimates and others to calculate historic rainfall records for the Santa Paula area.

Wet weather dominated the decade from 1770 to 1781, with average annual precipitation of almost nineteen and a half inches. The next thirty years from 1781 to 1809 brought a dry era with severe droughts in 1807 and 1809. The wet period from 1809 to 1825 brought major floods to Southern California during 1811, 1815, 1820-1821, and 1824-1825. A five year dry cycle occurred, followed by a wet period from 1832 to 1840, with flooding in that last year. A forty plus year dry cycle averaged about fifteen inches of precipitation annually from 1840 to 1883. However, this period was punctuated by floods, the most devastating in 1861-1862. J.M. Guinn recorded that the flood waters "made an inland sea of the Santa Clara Valley." Reginaldo F. Del Valle, interviewed by Vern Freeman in 1938, claimed that "In the flood of 1861-1862 the Santa Clara River took out quite a lot of land. Acreage planted to a number of crops was taken out.

The chapel located near the adobe [on Camulos Ranch] came near [to] being washed away. It was saved by building sand bag levees around it." It was also reported that the road to Los Angeles, adjacent to the river, was impassable for three weeks. Landslides were also recorded (Freeman 1968, U.S. War Department 1945).

Despite this flood, drought dominated the period. Drought from 1856 to 1860 killed cattle, crops and destroyed the Indian's acorn crop; the drought of 1864 killed two-thirds of the livestock in Ventura County, forcing ranchers to find new sources of income such as sheep (Freeman 1968, U.S. War Department 1945).

Native Uses of the River

The first peoples to settle around the river were Native Americans of two different groups: the Tataviam and the Ventureño Chumash. The Tataviam lived on the upper Santa Clara River west to about Piru. The group settled throughout the drainage area of the river near water and on south-facing slopes (King and Blackburn 1978). Various maps show settlements on the river and its tributaries, especially Piru Creek. The Ventureño Chumash settled near the river from Piru west to the ocean. This group relied more on water and tended to settle at the confluences of the river and creeks such as the Santa Paula, Sespe and Piru (Kroeber 1925, Old Indian Villages n.d., Grant 1978).

Typical of other California Indian groups, the Tataviam and Chumash adapted their lives to available water sources. The rhythm of the river shaped their daily and yearly routines. While they believed in manipulating the environment, they centered their lifestyles around the capacity of the land (Hundley 1992).

Riparian Resources

Both the Chumash and Tataviam relied on the resources of the river for their food supplies, material culture, and transportation. Table 1-2 below lists common riparian plants known to grow in or around the Santa Clara River, and used by the Chumash and Tataviam.

Table 1-2
Riparian Plants Used by the Chumash and Tataviam

Acorns (*Quercus agrifolia and Q. lobata*)

Both groups depended on the acorn mainly from the California Live Oak (*Quercus agrifolia*), and sometimes the Valley Oak (*Quercus lobata*) for a staple food. Water from the river was crucial to leach toxic tannin from the acorns. They did this in two ways: They shelled the acorns, placed them in a basket, buried them in the sand of the river for a year. Alternately they created a sand filter in the bed of the river in which they placed acorns, and poured hot water over them washing out the bitterness. The final product was a meal used for bread and paste. Oaks grew throughout the region where there was a consistent groundwater table.

Carrizo grass (*Phragmites communis*)

Carrizo grass, or common reed, grows in sloughs and marshes and was harvested for thatching houses.

Tule (*Scirpus acutus var. occidentalis*)

Similar to carrizo grass, tule grows in marshes or on stream banks, and was used for thatching, floor covering and wrapping.

Indian hemp (*Apocynum*), Nettle (*Urtica*), Milkweed (*Asclepias*)

The Chumash and Tataviam wove the fibers of these plants into cord. Hemp and nettle grow in moist places near streams and springs. Milkweed grows in arroyos, washes and canyons.

Wild cherry (*Prunus ilicifolia*)

The seeds of the wild cherry, which grows in canyons and on slopes, were leached, ground and made into a soup. The fruits were boiled.

Cattail (*Typha latifolia*)

The Chumash and Tataviam had several uses for the cattail, which grows in marshy areas. The pollen provided flavoring for a bread, roasted roots created the base for a meal, and its young shoots were eaten. Leaves were woven into floor mats and roofing thatch, while the leaves and leaf-sheaths provided a caulking material for use in canoes and houses.

Table 1-2 (continued)

Water Cress (*Rorippa nasturtium-aquaticum*)
This common green grows along streams, springs, marshes and marshes. It continues to be harvested today.

Soap plant (*Chlorogalum sp.*)
The soap plant had several uses. The pulp of the green bulb was used as soap, or the roasted bulb was eaten. Husks from the plant, which grew in open coastal sage scrub, could be made into brushes. As well the plant could be crushed and used as a fish poison. Turkey mullein (*Eremocarpus setigerus*), which grew in disturbed areas, was also used for this purpose.

California Bay Laurel (*Umbellaria californica*)
The berries of this tree, found in canyons, were roasted and eaten.

California Walnut (*Juglans californica*), White Alder (*Alnus rhombifolia*)
The roots of these riparian trees were used to make wooden bowls and plates. Alders grow near permanent streams such as Sespe and Piru creeks, while walnuts live in canyons, or on the margins of intermittent streams in sandy soil.

Source: Balls 1962, Hundley 1992, Jepson 1993, Grant 1978, Faber 1989, Bolton/Crespi 1927, King and Blackburn 1978, Grant 1978, Kroeber 1925.

The indigenous population also used other riparian resources. For example they created a delicacy, referred to by an early observer as a "sweet preserve like little raisins," from eggs deposited by flies on the tules and marsh grass of the river bed (Bolton/Crespi 1927, Cleland 1940). Migratory birds from lagoons and fish from the lower river and creeks rounded out the diet of the Chumash and Tataviam.

Naming of the River and First Spanish Settlement

Father Juan Crespi gave the river its name on his initial exploration of the valley with the Portola Expedition in 1769. Crespi, scouting sites to build missions in early August, designated the valley and river after Saint Clare of Assisi who had an upcoming feast day (Gudde 1969). Table 1-2 notes Crespi's observations of an extensive riparian system from Castaic Creek east to Santa Paula.

After the 1782 establishment of Mission San Buenaventura, the mission administrators used the labor of the Chumash and Tataviam. The Spanish and Mexican priests brought with them different values and technologies regarding water. They viewed water primarily as a resource to be harnessed for the good of the community (Hundley 1992). In this context, the first diversions of the river occurred at Santa Paula. Chumash laborers created a ditch and a reservoir to irrigate mission crops to feed livestock (Triem 1985).

Spanish-Mexican Uses of the River

Following secularization of the missions in the 1830s, Spanish-Mexican law and custom shaped the use of the river. Community rights not only had priority over the environment, but also over individual rights. For example, in communities (such as San Buenaventura), the maintenance of the main irrigation ditch, or zanja madre, fell on the whole population. Private diversion of water for irrigation did not occur unless decrees from the Mexican government specifically allowed it. If an individual, for example a rancho owner, petitioned the government for diversion rights, generally a maximum of ten percent of the land could be irrigated. This system assumed irrigated crops would be used only for the subsistence of the people and animals on the land. On maps of these land grants (diseños) "de riego" indicated irrigated land, and "labor" indicated cropland that could be irrigated if necessary. If an individual without rights irrigated cropland, and no one complained for ten years, legal rights could usually be affirmed. Government authorities increased and decreased the percentage of designated irrigable land when petitioned (Hundley 1992).

However, to survive and support the laborers who worked the ranchos, most owners diverted water for several crops including fruit, corn, beans and potatoes (Hundley 1992). The rancheros along the river also provided food supplies for travelers. A party traveling in 1847 camped near present day Fillmore and "found an abundance of corn, wheat, and frijoles." In the following days they walked about twenty miles up the river, finding two more ranchos with crops. One of the members observed that "there appears to be a larger supply of wheat, maize, beans, and barley in the granaries of the ranchos [further up the river]. More attention is evidently given to the cultivation of the soil here [likely at Camulos] than further [west], although neither the soil nor climate is so well adapted to raising crops" (Bryant 1847).

Evidence from Diseños

A fairly detailed diseño from 1838 confirms a typical pattern of rancho river and land use. Rancho Sespe, located along the river from Timber Canyon to just east of Fillmore, was devoted to cattle raising. Don Carlos Carrillo originally petitioned for the land in 1829 for the purpose of pasturage; therefore the bed of river was not included in the grant because it did not produce pasturage. The map (Becker 1964 map 29) shows several "abrevaderos" or watering places for cattle near the bank of the river. As cattle grazed all year, one can assume the abrevaderos had a constant water supply easily accessible to livestock. An irrigated field appears in the diseño, very small and abutting the north bank of the river. The map also indicates several "cienegas" or marshy areas on the land, perhaps indicating a high water table or poor drainage. On the south side of the bank, across from Timber Canyon, evenly spaced symbols appear to represent trees. This might simply indicate an area of heavy vegetation or intentionally planted trees, although the designation "labor" or "de riego" is absent.

After Carrillo's death the title to the land eventually was purchased by T. Wallace More who increased the amount of livestock on the land. More was known as "one of southern California's great cattle barons," and was active in the hide and tallow trade, as well as providing meat for the crowds streaming to the California gold fields (Becker 1964 map 29). As the livestock trade flourished in the 1840s and 50s, Rancho Sespe maintained between 8,000-11,000 head of cattle, sheep, horses and mares (Cleland 1940).

Another diseño from the Spanish-Mexican era depicts Rancho San Pedro, a small parcel of land later incorporated into the immense Rancho Rio de Santa Clara. The 1852 map (Becker 1969 map 3) locates the land very near the mouth of the river. The map represents a regular strip of vegetation along the bank of the river, either intentional planting to stabilize the bank and dunes or extensive native bank vegetation. Given that floods occurred in 1850 and 1853 (Freeman 1968) the vegetation could have grown fairly densely. Two freshwater lakes, "lagunas agua dulce," appear near the sand dune border with the ocean and near the border of the river. These fresh water lakes could be bits of McGrath Lake or something similar, perhaps drainage ponds. An 1855 map shows McGrath Lake in the same position as it is today, and a sandbar across the mouth of the river. It has been estimated that 870 acres of estuary existed at the mouth of the river in the mid-nineteenth century (Swanson et al. 1990, Map of the Mouth of the Santa Clara River 1855).

The area was mapped again fifteen years later as Rancho Rio de Santa Clara. Surveyors estimated the mouth of the river at fifteen to twenty chains (330 to 440 yards), the sand dunes parallel to the ocean between 100 to 500 yards, and the "swampy land full of sloughs and lagunas [lakes] extending along the whole front of the rancho" between one-half to three-quarters of a mile wide (Cota 1867).

Grazing, Plant Life and Sandstorms

Like most other ranchos, Rancho San Pedro, later Rancho Rio de Santa Clara, was devoted to livestock raising. Two corrals, an old and a new, appear on the first map. Observations from the era confirm large herds of livestock at other ranchos along the river (Coulter 1835, Bancroft 1886 vol. 2, Cleland 1940, Smith 1977). In 1850 two lost travelers stumbled upon Rancho San Francisco, which extended from Soledad Canyon to Piru Creek, and is now part of Newhall Land and Farming. They noted:

> a beautiful meadow ... green as a thick carpet of grass ... and shaded with oaks, wide branching and symmetrical...; while all over the low mountains that bordered it on the south and over the broad acres of luxuriant grass was a herd of cattle numbering many hundreds if not thousands (Newhall 1958).

Grazing livestock did have an impact on the river and its associated riparian habitats. It has been documented that grazing "may lower [plant] reproduction densities in floodplain areas" (Faber 1989). If livestock eat the groundcover it cannot reproduce, and in turn it cannot provide the environment (e.g. shade) for the growth of small shrubs. Increased erosion is one result. Additionally, this loss of vegetation leads to a reduction of food for aquatic animals, and less stable banks. Consequently sediment in the river increases which, along with animal waste, lowers water quality. Given that governments permitted open ranges to 1891, this series of events is a likely scenario. Grazing is also associated with the replacement of native perennial grasses with introduced and less nutritious perennials, and aggressive annuals (Faber 1989, Rowley 1985, *California's Rivers* 1993).

The loosened sediment from erosion probably encouraged the sandstorms that continue on sections of the river today. The sheer quantity of livestock grazing near the river makes this a likely scenario, although sandstorms could be promoted by several factors including drought or Santa Ana conditions. Many travelers in the rancho era noted the intensity of sandstorms. For example, in January 1847 an observer near Saticoy remarked that "The wind has blown a gale in our faces all day, and the clouds of dust have been almost blinding...." And about seven miles up the valley he noted "the wind blowing to almost a hurricane, and the dust flying so as nearly to blind us" (Bryant 1847).

Until the mid 1860s, rancheros invested primarily in cattle. A shift to sheep raising occurred after drought caused heavy cattle losses. Subsequently heightened demand for wool influenced increased investment in sheep in the late 1860s and early 1870s. Rancho Sespe eventually supported 16,000 to 18,000 sheep (Cleland 1940). This shift in production, like many subsequent changes, affected the Santa Clara River. Sheep have different grazing patterns than cattle. Though better adapted to arid climates, they require closer tending and cause more damage as they graze (Rowley 1985). In 1875 a government surveyor noted the impact of sheep grazing near the river: "Sheep have made savage work ... by treading out the natural grasses (principally the annual "filaree") from the root, which, if not properly cared for, must become in a few years arid" (U.S. Army Engineering Department 1875 vol. 1).

Mining

During the end of the Spanish-Mexican era and beginning of Anglo dominance, mining began to occur near the river. The first gold "boom" in California began in 1842 near the river in San Feliciano Canyon, near Piru Creek. From 1842 until the 1848 discovery of gold in northern California, prospectors trickled into the area. Water, mining pans, and picks were the primary tools of early mining. The lack of water in San Feliciano and Placerita canyons limited the capacities of the miners. They mostly employed a method known as "dry-washing," which relied on the wind to separate sand from the heavier gold. More determined prospectors packed their soil on animals to use the water in Piru Creek. In 1842, about 100 miners worked the canyons, while in 1845 an observer noted about three dozen prospectors (Smith 1977). The small number of miners and their methods probably created a negligible impact on the river, although the sediment flowing from Piru Creek into the Santa Clara may have increased.

After the fortunes of the northern California mines declined in the 1860s, the attention of entrepreneurs turned to other river regions in the state, including the Santa Clara River. Maps noted the potential of quicksilver on the north side of the river from Santa Paula Creek to the Los Angeles County line, and silver at the confluence of the river and San Francisquito Creek. East and north in Soledad Canyon prospectors extracted copper at places like the Hancock Copper Mines (Map of Public Surveys 1866, Map of the States of California and Nevada 1869).

Section 2
The Commercial Era (1870 - 1920)

Historical Overview

The second period of the human history of the Santa Clara River, from the 1870s to about the end of World War I, can be characterized by the increasing control of water usage and land to facilitate emerging capital growth. Euro-American immigrants began arriving in the 1860s, and established larger scale agriculture and oil enterprises. Crops of sugar beets, walnuts, lima beans and citrus relied on irrigation from the river and groundwater. For example, it was during this era that Nathan Blanchard and Wallace L. Hardison founded the Limoneira lemon ranch, which developed into the world's largest lemon producer (McBane 1994). Hardison also founded Union Oil with Thomas Bard. This company, like Limoneira, rose to national prominence. As well, the Oxnard Brothers American Sugar Beet factory introduced a new agricultural crop into the county and became another constituent of the river. The growth of these industries served as the impetus for the Southern Pacific Railroad to build tracks linking Ventura County with the rest of California. The builders of the railroad constructed bridges and berms which altered the character

of the river. The combination of growing access to transportation and developing crops and markets anchored Ventura County as a growing center of California industry. Consequently the human uses of the Santa Clara River grew substantially. For the first time floods on the river were measured by the damage done to agriculture and individuals became increasingly concerned with ways to control and use the waters of the Santa Clara River.

Physical Setting

Natural History

Tables 2-1 and 2-2 represent birds and plants associated with the Santa Clara River in the 1870s and 1880s. The introduction and establishment of *Brassica nigra*, an invasive mustard was noted near the western portion of the river. Tule (*Scirpus validus*) was still found abundantly in the swampy areas of the river. The extensive bird list (Table 2-2) indicates species closely associated with riparian habitats. Comments in this table include the birds' frequency and status as either residents, breeders or visitors. The list includes an extensive representation of birds found both in lagoon and freshwater habitats. Several birds widely distributed in the nineteenth century, but rare in the twentieth are listed such as Ross' Goose, Trumpeter Swan, White-tailed Kite, Golden Eagle, Bald Eagle, Peregrine Falcon, and Osprey.

See the maps and text in section 3 for a discussion of changes in the morphology of the river during this era.

Table 2-1

Flora Observed Near The River, 1875

n.b. Taxonomic names change over time. Those listed below were identified in the years noted, and may not correspond with current designations.

Clematis ligusticifolia, Nutt. var. *californica*, Wats. head of Piru Creek
Sisymbrium canescens, Nutt. head of Piru Creek
Brassica nigra, Boiss. "Introduced and has become a most obnoxious weed ... Sometimes growing 8-10' high, as in the Western portion of the Santa Clara Valley.
Isomeris arborea, Nutt. "The common dry ground shrub in portions of the Santa Clara Valley."
Rhamnus californica, Esch. head of Piru Creek, "appears to be var. *tomentella*, Gray
Lupinus luteolus, Kellogg. head of Piru Creek
Trifolium involucratum, Willd. var. *heterodon*, Wats. head of Piru Creek
Potentilla gracilis, Dougl., var. *rigida*, Wats. head of Piru Creek
Epilobium paniculatum, Nutt. head of Piru Creek
Boisduvalia densiflora, Wats. head of Piru Creek
Mentzelia gracilenta, T. & G. head of Piru Creek
Lessingia ramulosa, Gray, var. *tenuis*, Gray. head of Piru Creek
Aster menziesii, Lindl. head of Piru Creek
Tessarea borealis, T. & G. Santa Clara Valley
Helianthus petiolaris, Nutt. head of Piru Creek
Hemizonia ramosissima, Benth. Santa Clara Valley
Achillea millefolium, L. head of Piru Creek
Senecio dougalasii, DC Francisquitio Pass
Stephanomeria exigua, Nutt. head of Piru Creek
Dodecatheon meadia L., var. *alpinum*, Wats. head of Piru Creek
Asclepias mexicana Lake Elizabeth
Gilia virgata, Steud. head of Piru Creek
Nicotiana attenuata, Torr. Santa Clara Valley and head of Piru Creek
Mimlulus floribundus, Dougl. head of Piru Creek
Castilleia minor, Gray. head of Piru Creek
Stachys albens, Gray. head of Santa Clara Valley
Eriogonum nudum, Dougl., var. *pauciflorum*, Wats. head of Piru Creek
Eriogonum fasciulatum, Benth. Camulos Ranch
Eriogonum baileyi, Wats. head of Piru Creek
Salix laevigata, Bebb, var. *angustifolia*. Lake Elizabeth
Scirpus validus, Vahl. "This is the well-known Tule of California, forming dense masses along lake and river shores, from four to ten feet high."
Elymus triticoides, Nutt. head of Piru Creek

Source: U.S. Army vol. 6 1889 353-378

Table 2-2
Birds Observed Near The River, 1872-1873, 1879-1881

n.b. Taxonomic names change over time. Those listed below were identified in the years noted, and may not correspond with current designations.

1. Western Grebe (*Aechmophorus occidentalis*). "Seen occasionally in the bay in winter.... a fine specimen ... was caught December 10, 1880, in the Santa Clara River, above Santa Paula, eighteen miles from the coast."

2. American Eared Grebe (*Colymbus nigricollis californicus*). "Rather common in winter; a few breed in the marshes along the coast."

3. Pied-Billed Grebe (*Podilymbus podiceps*). "Common resident in the lagoons, where they breed sparingly."

4. American White Pelican (*Pelecanus erythrorynchus*). "Often seen among the lagunas in winter."

5. Mallard (*Anas boschas*). "Common during the winter, frequenting fresh water."

6. Gadwall (*Anas strepera*). "A common winter resident. More shy and quiet than most other species, feeding most usually after twilight."

7. Pintail (*Dafila acuta*). "A winter resident; not common."

8. Baldpate (*Anas americana*). "The Baldpate, or Widgeon, is one of the most abundant of our winter Ducks. Few, if any, remain to breed."

9. Green-winged Teal (*Anas carolinensis*). "this is one of the most abundant and generally diffused of our Ducks, it being found during the wet season in almost every little stream or pool."

10. Cinnamon Teal (*Anas cyanoptera*). "... resident in the county, but is most common during the summer."

11. Shoveller (*Spatula clypeata*). "... common winter resident."

12. Wood Duck (*Aix sponsa*). "... found throughout the year in greater or less abundance."

13. Redhead (*Aythya americana*). "... common resident of the county. I obtained ... its eggs in May."

14. Canvasback (*Aythya vallisneria*). "... common winter resident."

15. American Goldeneye (*Glaucionetta clangula americana*). "Winter resident, not common."

16. Bufflehead (*Charitonetta albeola*). "... common winter resident."

17. Ruddy Duck (*Erismatura rubida*). "... common winter resident."

Table 2-2 (continued)

18. Lesser Snow Goose (*Chen hyperborea*). "On November 20, 1880, I secured the only individual of this variety I ever saw in the county.... I was spending a day gunning among the lagunas near the mouth of the Santa Clara River."

19. Snow Goose (*Chen hyperborea nivalis*). "An abundant winter resident."

20. Ross's Snow Goose (*Chen rossii*). "Frequent in winter, associated with *C. hyperboreus nivalis*, from which it can be distinguished by its cry...."

21. American White-fronted Goose (*Anser albifrons gambeli*). "This is, perhaps, the most abundant of all the Geese ... and is usually the first to arrive.... so destructive are its ravages upon the growing wheat crop, that farmers often find it necessary to employ men by the month to hunt and drive them from their fields."

22. Canada Goose (*Branta canadensis*). "A winter resident, but not so common as the preceding."

23. Whistling Swan (*Olor columbianus*). "A frequent winter visitant to the lagunas along the coast."

24. Trumpeter Swan (*Olor buccinator*). "Winter visitant with the preceding species, but more common."

25. White-faced Glossy Ibis (*Plegadis guarauna*). "One specimen gotten near Santa Paula May 14 [1880]. This is the only specimen I ever saw in Ventura County, but on the San Joaquin Plains I found them common in July."

26. American Bittern (*Botaurus lentiginosus*). "Resident; not common."

27. Great Blue Heron (*Aredea herodias*). "A common resident. Several pairs nested in the cottonwoods near the mouth of the Santa Clara River."

28. American Egret (*Ardea egretta*). "Common resident among the marshes near the coast."

29. Snowy Heron (*Ardea candidissima*). "Resident; most frequent near the mouth of the Santa Clara River."

30. Green Heron (*Ardea virescens*). "Summer resident; not common. A few probably winter in the county, but most all go futher south."

31. Black-crowned Night Heron (*Nycticorax nycticorax naevious*). "Probably resident, but not common."

32. Sandhill Crane (*Grus mexicana*). "Occasionally seen during migrations."

33. American Coot (*Fulica americana*). "An abundant winter resident, both on the shore and in the streams and marshes. A few breed in the lagunas."

34. Wilson's Snipe (*Gallinago delicata*). "A rare winter resident, but a common spring migrant."

35. Greater Yellowlegs (*Totanus melanoleucus*). "Seen frequently along the Santa Clara River. Probably resident."

36. Long-billed Curlew (*Numenius longirostris*). "Frequent along the coast...."

Table 2-2 (continued)

37. Hudsonian Curlew (*Numenius hudsonicus*). "A winter visitant; not common."

38. Killdeer (*Aegialitis vocifera*). "Rather abundant resident."

39. Snowy Plover (*Aegialitis nivosa*). "Resident along the coast and rather abundant."

40. California Partridge (*Callipepla californica*). "Very abundant resident. Nests in March and April. Albinism is not infrequent; I have three beautiful cream-colored specimens secured near Santa Paula."

41. Band-tailed Pigeon (*Columba fasciata*). "The only specimen of this bird I ever saw in the county I got February 28, 1880, near the mouth of Santa Paula Cañon. It was a female and was feeding upon the young balls of the sycamore, no less than thirty-five of which I took from its crop. Residents of Santa Paula inform me that it was common only a few years ago."

42. Mourning Dove (*Zenaidura macroura*). "An abundant resident. Nests early in April."

43. California Vulture (*Pseudogryphus californianus*). "Resident among the higher mountains, descending only to the valleys and cañons to feed upon carrion."

44. Turkey Vulture (*Cathartes aura*). "An abundant resident. During the winter more than a hundred roosted in a grove of eucalyptus trees near Santa Paula."

45. White-tailed Kite (*Elanus leucurus*). "A rare resident. I knew of only four or five pairs in the Santa Clara Valley from the coast to the Sespe, -- about twenty miles. I obtained a full set of eggs April 12[, 1880]."

46. Marsh Harrier (*Circus hudsonius*). "Resident; rather common. Nests on the ground early in April."

47. Sharp-shinned Hawk (*Accipiter velox*). "Seen occasionally during the winter."

48. Cooper's Hawk (*Accipiter cooperi*). "Resident, but not common."

49. Western Red-tail (*Buteo borealis calurus*). "An abundant resident. Nests early in March, -- sometimes even in February."

50. Red-bellied Hawk (*Buteo lineatus elegans*). "A common resident. Nests not quite as early as [the Western Red-tail]."

51. American Rough-legged Hawk (*Archibuteo lagopus sancti-johannis*). "A rare resident; most numerous in winter."

52. Bald Eagle (*Haliaeetus leucocephalus*). "Resident; frequent along coast."

53. Sparrow Hawk (*Tinnunculus sparverius*). "A common resident. I have found it nesting in the deserted nests of the Magpie."

54. American Barn Owl (*Strix flammeus americanus*). "An abundant resident .... It most frequents the deeper barrancas, steep cliffs, and the dense foliage of live oaks."

Table 2-2 (continued)

55. American Long-eared Owl (*Asio wilsonianus*). "An abundant resident; found dozing during the day among the live-oaks or the groves of willows along the streams."

56. Screech Owl (*Megascops asio*). "Common resident."

57. Western Horned Owl (*Bubo virginianus subarcticus*). "Resident, common; nests early in February."

58. Belted Kingfisher (*Ceryle alcyon*). "Resident, but does not seem to be common in any part of the county."

59. Harris's Woodpecker (*Dryobates villosus harrisi*). "Resident throughout the year; common. Nests in early March. I have frequently observed a tendency toward albinism among individuals of this species."

60. Gairdner's Woodpecker (*Dryobates pubescens gairdneri*). "A common resident and generally distributed."

61. Nuttall's Woodpecker (*Dryobates nuttalli*). "Resident, but not so common as the preceding."

62. California (Acorn) Woodpecker (*Melanerpes formicivorus bairdi*). "Resident and locally abundant."

63. Lewis's Woodpecker (*Melanerpes torquatus*). "I have taken this handsome Woodpecker at Newhall ... and at Pacheco Pass...."

64. Red-shafted Flicker (*Colaptes cafer*). "An abundant resident."

65. Poor-will (*Phalaenoptilus nuttali*). "Summer resident; not common."

66. Western Nighthawk (*Chordeiles virginianus henyri*). "Common migrant; a few breed."

67. White-throated Swift (*Micropus melanoleucus*). "On February 19, 1881, while on a high mesa near where Santa Paula Creek enters the valley, I saw perhaps a score of White-throated Swifts circling high in air overhead."

68. Black-chinned Hummingbird (*Trochilus alexandri*). "Rather common summer resident."

69. Costa's Hummingbird (*Trochilus costae*). "Summer resident, rare."

70. Anna's Hummingbird (*Trochilus annae*). "A summer resident; more common than either of the preceding."

71. Rufous Hummingbird (*Trochilus rufus*). "... the most abundant species of Hummers found in the county. It is resident, except for a few weeks in midwinter. I found it very common in April and May in the thickets near the mouth of the Santa Clara River."

72. Western Kingbird (*Tyrannus verticalis*). "... common summer resident, arriving last week of March."

73. Cassin's Kingbird (*Tyrannus vociferans*). "Summer resident; more common than *verticalis*."

Table 2-2 (continued)

74. Ash-throated Flycatcher (*Myiarchus cinerascens*). "A summer resident; arrives about the middle of April. Not very common."

75. Say's Phoebe (*Sayornis saya*). "A winter resident; not common."

76. Black Phoebe (*Sayornis nigracans*). "A common resident throughout the year. Nests as early as April 1."

77. Western Wood Pewee (*Contopus richardsoni*). "... summer resident, but not common."

78. Hammond's Flycatcher (*Empidonax hammondi*). "Summer resident; not common."

79. American Crow (*Corvus americanus*). "Common resident."

80. Northwest Crow (*Corvus caurinus*). "An abundant resident."

81. Yellow-billed Magpie (*Pica nuttalli*). "... resident ... and abundant in suitable places. They are most likely to be found in any cañon where sheep or other stock are herded."

82. California Jay (*Aphelocoma californica*). "... one of the most common and generally distributed birds of the county."

83. Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). "Abundant winter resident."

84. Bicolored Blackbird (*Agelais gubernator*). "Common; resident."

85. Tricolored Blackbird (*Agelais tricolor*). "An abundant resident."

86. Western Meadowlark (*Sturnella magna neglecta*). "Abundant in winter."

87. Arizona Hooded Oriole (*Icterus cucullatus nelsoni*). "... common summer resident arriving about the first of April.... It has never been recorded north of Los Angeles, I believe."

88. Bullock's Oriole (*Icterus bullocki*). "Summer resident; somewhat more common than the Hooded. Arrives last week in March."

89. Brewer's Blackbird (*Scolecophagus cyanocephalus*). "One of the most abundant residents. Nests usually in live-oaks near dwellings."

90. Crimson House Finch (*Carpodacus frontalis rhodocolpus*). "Resident. Perhaps the most abundant bird of the county."

91. American Goldfinch (*Spinus tristis*). "Common. Resident throughout the year."

92. Arkansas Goldfinch (*Spinus psaltria*). "Not common. Resident from April to October."

93. Lawrence's Goldfinch (*Spinus lawrencei*). "Common summer resident. Probably the most abundant representative of the genus."

Table 2-2 (continued)

94. Western Savanna Sparrow (*Ammodramus sandwichensis alaudinus*). "Resident in old fields and meadows. Not common."

95. Belding's Marsh Sparrow (*Ammodramus beldingi*). "Resident; frequent near the coast."

96. Western Vesper Sparrow (*Poocaetes gramineus confinis*). "Resident? Not common."

97. Western Lark Sparrow (*Chondestes grammacus strigatus*). "Common resident. Scarcely distinguishable from the eastern form."

98. Gambel's Sparrow (*Zonotrichia gambeli*). "An abundant winter resident."

99. Golden-crowned Sparrow (*Zonotrichia coronata*). "Winter resident; frequent in the foothills and mountains; seldom seen in the valleys."

100. Western Chipping Sparrow (*Spizella socialis arizonae*). "Summer resident. Rare."

101. Heermann's Song Sparrow (*Melospiza fasciata heermani*). "Resident; not very common."

101. Samuel's Song Sparrow (*Melospiza fasciata samuelis*). "Resident; very common."

102. Rusty Song Sparrow (*Melospiza fasciata guttata*). "Resident; rare."

103. Spurred Towhee (*Pipilo maculatus megalonyx*). "Resident. Common."

104. California Brown Towhee (*Pipilo fuscus crissalis*). "Resident. One of the most abundant and best known birds."

105. Black-headed Grosbeak (*Habia melaocephala*). "Summer resident; common. Arrives about April 23."

106. Blue Grosbeak (*Guiraca caerulea*). "Rare. Perhaps a summer resident...."

107. Lazuli Bunting (*Passerina amoena*). "... rather common as a summer resident."

108. Western Tanager (*Piranga ludoviciana*). "A summer resident; not common."

109. Purple Martin (*Progne subis*). "Summer resident; moderately common, nesting usually in holes in trees."

110. Cliff Swallow (*Petrochelidon lunifrons*). "An abundant summer resident."

111. Barn Swallow (*Chelidon erythrogaster*). "Summer resident, but not common."

112. Tree Swallow (*Tachycineta bicolor*). "Summer resident, abundant. Many breed in holes in the willows near the mouth of the Santa Clara River."

113. Violet-green Swallow (*Tachycineta thalassina*). "... rather common during the spring migrations. A few remain to breed."

114. Bank Swallow (*Clivicola riparia*). "Summer resident; locally abundant."

Table 2-2 (continued)

115. Rough-winged Swallow (*Stelgidopteryx serripennis*). Perhaps a common summer resident, but usually confounded with the preceding."

116. Cedar Waxwing (*Ampelis cedrorum*). "A frequent winter visitant. Often seen in flocks of six to twenty about the peppertrees, upon the berries of which they feed."

117. Phainopepla (*Phainopepla nitrens*). "... found in the valley near Santa Paula [April to October].

118. White-rumped Shrike (*Lanius ludovicianus excubitorides*). "A common resident."

119. Warbling Vireo (*Vireo gilvus*). "Summer resident, but not common."

120. Hutton's Vireo (*Vireo huttoni*). "Not common."

121. Least Vireo (*Vireo bellii pusillus*). "I am not sure that I ever saw this bird, but think I saw a few among the oaks near Sisa [Sespe?] Cañon in January."

122. Yellow Warbler (*Dendroica aestiva*). "A common migrant."

123. Audubon's Warbler (*Dendroica audubonî*). "An abundant winter resident. This is by far the most common species of the family found on the coast."

124. Grace's Warbler (*Dendroica graciae*). "I never saw but one specimen of this beautiful Warbler, -- a male in fine plumage which I shot from a cottonwood tree near Santa Paula, May 3, 1881."

125. Western Yellowthroat (*Geothlypis trichas occidentalis*). "A common resident, nesting in the grass or tules about low marshy places."

126. Long-tailed Chat (*Icteria virens longicauda*). "A common summer resident."

127. Pileolated Warbler (*Sylvania pusilla pileolata*). "Common summer resident in suitable places. Arrives about the first week in April. I found it abundant in the willows near the mouths of the Santa Clara and San Buenaventura Rivers...."

128. American Pipit (*Anthus pensilvanicus*). "An occasional winter visitant."

129. American Dipper (*Cinclus mexicanus*). "Frequent along the mountain streams."

130. Mockingbird (*Mimus polyglottos*). "A common resident."

131. Californian Thrasher (*Harporynchus redivivus*). "A common resident.... Nests as early as February 21."

132. Parkman's Wren (*Troglodytes aedon parkmani*). "An abundant resident throughout the county."

133. Slenderbilled Nuthatch (*Sitta carolinensis aculeata*). "A rare winter visitant."

134. Plain Titmouse (*Parus inornatus*). "Common resident, most frequent among clumps of live-oaks.

135. Oregon Chickadee (*Parus atricapillus occidentalis*). "A rare winter resident."

Table 2-2 (continued)

136. Least Tit (*Psaltriparus minimus*). "A rather common resident."

137. Western Golden-crowned Kinglet (*Regulus satrapa olivaceus*). "With the preceding, a rare winter resident."

138. Blue-gray Gnatcatcher (*Polioptila californica*). "... moderately common resident, nesting usually in the live-oaks, about the middle of May."

139. Black-tailed Gnatcatcher (*Polioptila californica*). "Not so common as preceding. Resident."

140. Townsend's Solitaire (*Myadestes townsendii*). "A very rare migrant. I saw it once or twice in spring 1881."

141. Russet-backed Thrush (*Turdus ustulatus*). "A spring and fall migrant. Not common."

142. Dwarf Hermit Thrush (*Turdus aonalaschkae*). "A migrant with the preceding. Perhaps not so common."

143. Western Robin (*Merula migratoria propinqua*). "An abundant winter resident."

144. Varied Thrush (*Hesperocichla naevia*). "A rare winter visitant. Seen only on one occasion."

145. Western Bluebird (*Sialia mexicana*). "... a common resident."

146. Mountain Bluebird (*Sialia arctica*). "A rare winter visitant. A single individual was seen in December, near Saticoy."

147. Sora (*Porzana carolina*). "...on the marsh at Saticoy."

148. Northern Phalarope (*Phalaropus lobatus*). "A flock was seen in a pond near the seashore in July."

149. Yellowlegs (*Totanus solitarius*). "I saw some of this species in winter, near fresh water streams.

150. Swainson's Hawk (*Buteo swainsoni*). "[observed] chiefly in the West Grove [three to four miles west of Saticoy, along the South bank of the Santa Clara River], where they came in flocks in September.

151. Golden Eagle (*Aquila chrysaetos*). "Not rare during my residence [in Saticoy, 1872 -1873].... Their destructiveness to lambs causes them to be shot without mercy by farmers and they are becoming scarce."

152. Peregrine Falcon (*Falco peregrinus anatum*). "I shot one in the West Grove [three to four miles west of Saticoy, along the South bank of the Santa Clara River].

153. Pigeon Hawk (*Falco columbarius*). "I shot three of this species in winter, all agreeing with the typical form."

154. Osprey (*Pandion haliaetus carolinensis*). "... saw a few near the coast where they were then [1872-1873] more plenty."

155. Yellow-shafted Flicker (*Colaptes auratus*). "I shot one in the West Grove in November, and as it is everywhere rare on this coast, it may be considered a winter straggler."

156. Vaux's Swift (*Chaetura vauxii*). "Migrating flocks appeared April 22, 1873, at Saticoy, but did not remain, seeking the high pine woods at that season."

Table 2-2 (continued)

157. Western Flycatcher (*Empidonax difficilis*). "Arrived at Saticoy March 18, 1873, but none remained near there in summer...."

158. Vermilion Flycatcher (*Pyrocephalus rubineus mexicanus*). "I shot two perfect male specimens of this brilliant subtropical bird in West Grove on October 21 and November 7, [1872]. Seeing no more west of the Colorado Valley, except one near San Diego, I considered it a rare species, but one that probably breeds in the county."

159. Common Raven (*Corvus corax sinuatus*). "The Raven was very common [in 1872 -1873].... I once counted thirty soaring with Turkey Buzzards, above a sheep fold near East Grove [about three miles east of Saticoy where the Santa Clara River runs permanently and a grove of poplars and willows lines its marshy shores for several miles], it is their frequent habit about midday, after feeding on dead sheep when the flocks have gone out for the day."

160. Brewer's Sparrow (*Spizella breweri*). "I shot two from a small migrating flock of this species near East Grove, April 10, [1873], the only time I met with any...."

161. Lincoln's Sparrow (*Melospiza lincolni*). "Not rare about Saticoy Grove in winter."

162. Fox Sparrow (*Passerella iliaca unlaschkensis*). "A few of this species wintered near Saticoy...."

163. Marsh Wren (*Cistothorus palustris*). "A few seen in the Saticoy marsh in winter only."

Sources: Evermann 1886, Cooper 1887, Robbins 1966.

Floods

The flooding of the Santa Clara River continued its unpredictable rhythm between 1870 and 1920. In the floods of 1876, the Santa Clara River "did considerable damage to some of the farmers" living near the Cienega, about one mile east of Fillmore. The deluge swept away grape vines on Camulos Ranch, damaged 1100 acres of T.M. Moore's choicest land, and carried off a house near the river. In response to this particular flood, the Del Valles of Camulos Ranch built flood control structures along the river bank. The Ventura *Signal* recorded: "Señor del Valle is piling his land bordering the river, to prevent any more such encroachments." The *Signal* further recorded that "Sespe farmers are contemplating building a levee on the Santa Clara during the coming summer, thereby reclaiming the lands rendered worthless by the inundation of the water during the winter."

The next wet cycle occurred from 1883 to 1893 with major flood damage in the winter of 1883 and 1884. Lowell Hardison recalled the dry early winter, "the valley was so full of dust that South Mountain was only an outline against the sky. The Santa Clara River became a dry bed of sand." The floods soon ended that. Hardison continued, "High water came out of the canyons to the river with the whole valley from [Piru] to Buckhorn solid water clear across the valley." But that was just the beginning. After the rains and snow, "The whole county was flooded. The railroads and all wagon roads were washed out." Communities became isolated as crossings of both the river and Sespe were halted. Hardison continued, "The banks of the Santa Clara River, the Sespe and Santa Paula Creeks that had been lined with great oak, sycamores and cottonwood trees, that stood for centuries on their banks, had been swept bare. Many buildings had been built in their shade, had kept them company. Many cattle, sheep, horses, and hogs ... drowned or [were] lost in the mud." The February 1884 floods were followed by ten inches of March rains. The Santa Clara River broke out of its channel at El Rio, and headed towards its previous southern channel, although local efforts at flood control diverted the flow. New islands formed in the river, as well. Hardison recalled that "from our cabin window [in Santa Paula] we had a fine view of the Santa Clara Valley below. It looked like one great lake as far as the eye could reach. Clumps of trees could be seen standing in the water and occasionally a stranded house or other things on the shore of the river." Another resident recalled that Ellsworth Barranca was half-full from bank to bank, carrying mud, trees, and rocks along with buildings (Freeman 1968, U.S. War Department 1945).

In the same flood of 1883-1884, the Los Angeles County section of the river also sustained heavy damage. The flood waters were reported to have "swept down Soledad Canyon and carried the Southern Pacific Railroad track out of the canyon down the Santa Clara River to the sea." Observers reported bridge beams, railroad ties and telegraph poles at the mouth of the river. Recorded J.M. Guinn: "The Santa Clara River spread out over the valley and for some time rivaled the Mississippi River during a spring rise."

The next flood year, in 1885-1886, resulted in railroad washouts and halted communications. In 1889, J.E. Borchard "lost a large part of his ranch along with many others whose land adjoined

the south bank of the Santa Clara River near its mouth," according to a letter to the Ventura *Star Free Press* (Freeman 1968). As well, Santa Paula Creek overflowed into the city. The Santa Clara River additionally washed away land and created other damage during 1892-1893 (U.S. War Department 1945).

Drought followed in the next decade from 1893 to 1904, stimulating the use of a large number of water wells and pumps. During this decade, Los Angeles County discovered that its water demands could not be met locally and began to plan for the importation of water from the Owens River via the aquaduct. Plans for water imporation included the construction of the San Francisquito Dam.

The next wet cycle, from 1904 to 1918, brought a number of floods. Railroad damage occurred near Piru, Sespe and Fillmore, with additional tracks washed out at Buckhorn and Castaic in 1904 and 1905 (Freeman 1968). Reports noted that year's flood destroyed ninety acres of land and 1,200 apricot trees, along with other crop damage (U.S. War Department 1945). In 1909, flood water changed the course of Santa Paula Creek. Santa Clara River water flowed down River Street (now Harvard Boulevard). Later that year, floods damaged part of the Saticoy bridge abutment and farm lands near Saticoy (Freeman 1968). 1911 brought floods which destroyed a wing dam on Santa Paula Creek, causing the creek to leave its channel and flood Santa Paula. Along the Santa Clara, the railroad, bridges, and irrigation systems experienced damage (U.S. War Department 1945). Floods in 1914 washed away the homes and farm buildings of "Stringtown," the area near Bardsdale irrigated by the Stringtown Ditch. The floods washed away several hundred acres of fertile bench land below the bluff south of the river, and the land was "practically covered by sand." The flood also damaged railroad trestles and the county bridge across the Sespe. Railroad washouts also occurred in flooding during 1916 (Freeman 1968). Significant silting of agricultural lands was reported in 1913 and 1914 floods (U.S. War Department 1945).

Commercial Agriculture

Commercial agriculture began along the river in the 1860s and 1870s, supplementing and replacing livestock raising. After the devastating flood and drought cycles of those two decades, most investors shifted their interests from ranching to agriculture. Many nineteenth-century framers continued with familiar crops such as grain farming. They cultivated barley, corn, flax, alfalfa, oats and mustard. An economic botanist leading a party across the Oxnard Plain in 1875 described the crops:

> June 22, 1875. ... we crossed the western end of the Santa Clara Valley, and found the farmers engaged in harvesting their barley. Much of it they simply headed, allowing the straw to remain. Large fields of good corn were seen. It was just in tassel and gave promise

> of a heavy crop. it is hardly overreaching the truth to say that on that day we saw thousands of acres actually overrun with wild mustard, which attained the height of eight or ten feet.... In some places, indeed, it might well be doubted as to whether it was a mustard or barley field we were passing, both of which were luxuriant enough.... What more than anything surprised me in the day's march was that no attention was paid to fruit culture. I find recorded in my notes that not a single fruit tree was seen that day. There was no apparent reason for this (Wheeler 1876).

This botanist noted the aggressive and invasive nature of introduced crops such as wild mustard which, when coupled with the grazing of the previous era, outcompeted native grasses which stabilized the soil. Not surprisingly heavy rains washed increasing sediment into the river as single invasive species became dominant in the next decades. The lack of fruit crops mentioned by the botanist can be attributed to the alkaline soil on the Oxnard Plain as well as rudimentary irrigation in areas which would later become productive.

Another member of the botanist's party noted that "With the exception of the Camu[los] ranch, which consumes the waters of Penn Creek in irrigation, but little cultivation is attempted in the valley above Santa Paula" (Wheeler 1876). At that time the main agricultural development existed primarily along the lower fifteen miles of the Santa Clara River. In 1878 about eighty-five percent of crop acreage consisted of wheat, barley and corn. At that time about 8400 acres in Ventura County supported crops (Gidney 1917). Soon after these observations experimentation with new crops began. This experimentation included walnuts, citrus, sugar cane, grapes, malt, hops, mustard seed, and other tree crops like figs, apples and apricots (Gregor 1953, Triem 1985).

Agricultural Practices Intensify

Intensive agriculture began with the introduction of lima beans in 1875. Limas slowly began to displace grain as a major crop in the region, enabling more small farmers to become successful. Crop rotation began in the 1870s, but did not become a regular practice until the twentieth century. In areas like the Oxnard Plain, with its alkali soil conditions, crop rotation became particularly significant. By the late nineteenth century sugar beets, lima beans and barley became the dominant crops in this area. In 1898 farmers discovered the high earnings generated from sugar beets, and the ideal growing conditions provided by the Oxnard Plain, with its high water table and dissolved salts. Sugar beets consume nitrogen while lima beans manufacture nitrogen; thus the crops were complimentary. In areas of high alkali, barley can provide a third crop in the rotation. Sugar beet plantings in Ventura County reached a high in 1919, after which they were eclipsed by other crops such as citrus (Gregor 1953). The increasing agriculture on the Oxnard Plain began the lowering of the water table.

Experiments with citrus cultivation began in the late 1860s (Triem 1985), but did not develop into a profitable crop until the 1890s when the Limoneira Company was founded in Santa Paula. Gradually the Limoneira Company, under the leadership of C.C. Teague, Nathan Blanchard, Wallace Hardison and Charles McKevett, purchased land and converted land once devoted to other crops, such as walnuts, to citrus. Citrus cultivation was a risky and expensive business. It was different from other crops both because it grew only in microclimates specific to areas around the Santa Clara River. Development of citrus along the river was confined to Ventura County as the climate just east of Camulos Ranch became unsuitable. Early citrus ranchers learned by trial and error which areas could support citrus. As well, citrus required irrigation. Teague, Hardison, Blanchard and McKevett planned and engineered some of the first substantial diversions of the river. The Limoneira Company managed 340 acres of citrus in 1905, when the average Ventura County lemon ranch spanned between one to fifteen acres. In succeeding years the business purchased almost 2500 acres of nearby land to convert to citrus production. After World War I, citrus became the dominant crop, surpassing lima bean and walnut production (McBane 1994, Triem 1985, Blanchard 1983, Teague 1944).

Diversions

In the 1860s and early 1870s farmers depended primarily on dry farming techniques, using irrigation during dry seasons only (Triem 1985). An observer noted in 1875 that "The farmers though this region do not irrigate more than they can avoid, for the reason, as they state it, it brings alkali to the surface" (Wheeler 1876). However, with increased settlement and agricultural use of the Santa Clara River valley, dry farming was no longer a reliable option both because of drought and lower crop yields. Thus individuals began to use river water on a larger scale, generally through diversions. These diversions permitted the development of much irrigated land. Early in the 1900s, over 16,000 acres were irrigated by the surface flows of the Santa Clara River (Freeman 1968).

Example of such diversions abound in Ventura County history. In 1869 landowners constructed a sixteen mile ditch (from Santa Paula to Saticoy) which carried 18,000 gallons per minute. This ditch (run by the Farmers Canal and Water Company), also used Santa Paula Creek water. Entrepreneurs built the ditch to attract settlers to the region. In 1871 a local paper praised the development potential of the ditch: "A fine ditch -- the Saticoy-Santa Paula Ditch is slowly winding its way down the valley. It is a capricious waterway, and will suffice to irrigate many thousands acres of as fine lands as can be found in the Santa Clara Valley." The Santa Paula mill relied on water from this ditch to grind its grain (Triem 1985, Freeman 1968). By 1875 a traveler noted "... we passed by a large flourishing mill which was evidently doing a good business. Well-tilled farms became more common, and there seemed to be still more room and water sufficient for a much larger population" (Wheeler 1876).

In 1870, landowners organized the Santa Clara Irrigating Company, which brought river water to parts of Rancho Santa Clara del Norte and Rancho Rio de Santa Clara (also known as the

Colonia). This canal was nearly twelve miles long and twelve feet wide, with an additional two and a half mile branch canal. Water from the Cienega ditch, owned by the South Side Improvement Company, irrigated 1,600 acres in Bardsdale, on the south side of the river near Fillmore. A diversion from the Cienega ditch provided water to the "Stringtown" settlement (near Bardsdale), settled in the 1870s and early 1880s. The floods of 1884 destroyed the settlement and ditch, but developers reconstructed the ditch to serve adjacent farm lands.

Two other canals existed in the Santa Paula area. A small ditch on the north bank of the Santa Clara four miles east of Santa Paula Creek was used until after 1920, when it was replaced by turbine pumps. The River Street Ditch, built in 1887, irrigated Santa Paula farmland via a four and a half mile canal. The Farmers Irrigation Company purchased the River Street ditch, and renamed it Farmers Ditch (Freeman 1968). The Limoneira lemon ranch was the primary client of this river water. On the south side of the Santa Clara, the Turner Ditch or Hyde-Richardson Ditch, was built in 1888. Further east, the Chaffee Ditch ran from Rancho Camulos to Torrey Crossing from 1896 to 1899.

Tributaries of the Santa Clara were diverted as well. Individuals and towns diverted water from Santa Paula, Sespe, Piru, Hopper and Lord creeks in the latter quarter of the nineteenth century (Freeman 1968).

The number of diversions, dams and canals is difficult to quantify accurately. They varied in size and duration, subject to destruction by streamflows. Many structures appeared to have a short history. Other irrigation systems, particularly those established by corporations, survived for long periods.

A map of the Fillmore area in 1894 demonstrates the number and variety of ditches, diversions and other human interventions along the river at the junctions with Sespe Creek. Near the confluence was the diverting dam of the Chormicle and Bennison ditch, with an "old ditch" and "new ditch" indicated on the map. Upstream the map portrayed the old dam for the Kennedy ditch and the new "Bard et. al." dam, feeding the new Kennedy or Williams ditch, directed towards Bardsdale with a series of flumes. Also marked are the dry Stringtown or Cummings ditch (mentioned above) and the dry Sutton ditch. Further downstream, past the confluence, lay at least four additional dams, some with sizable reservoirs indicated. The hydrology of the river, with its fluctuating surface and ground water flow, is indicated by a point which states "water sinks" (Sespe Creek Confluence 1894).

By 1912 ditches appeared in similar areas, but with corporate owners such as Interurban Land and Water, Hardison Ranch Company, Fillmore Irrigation Company, Sespe Land and Water Company and the Southside Improvement Company. In several places on a 1912 irrigation map, pumping plants appear in or adjacent to the river and some of the ditches. These pumping plants indicate water usage beyond the intermittent surface flow. Approximately eighty percent of the level land surrounding the river and adjacent hills supported irrigated crops (Map Showing Irrigation Development 1912).

Further upstream the Camulos ditch, drawing from both Piru Creek and the Santa Clara River, irrigated crops on the north side of the river. The Piru Water Company Pipe Line paralleled Piru Creek and irrigated a section north and west of the confluence of the creek and river. Several pumping stations are represented on the south side of the river (Map Showing Irrigation Development 1912).

As the valley widened downstream from Fillmore, ditches became longer, pumping plants more plentiful, and irrigated lands increased significantly. The Farmer's Ditch had been purchased by the Santa Clara Water and Irrigation Company which operated two other ditches to channel river water to irrigate the Oxnard Plain (Map Showing Irrigation Development 1912).

The two maps (1894 and 1912) show a move from fragmented individual ownership to larger water companies who markedly increased irrigated acreage primarily with river water. During the Commercial Era agriculture became a business. Farmers became entrepreneurs, looking to business consolidation and legal entities such as corporations to increase the value of their product. Water from the Santa Clara River became a component in a complex capitalist system.

The Newhall Example

The property acquired by the Newhall family exemplifies trends in land use and agriculture during the Commercial Era. Henry Mayo Newhall purchased a portion of the immense Rancho San Francisco in the 1870s. Rancho San Francisco had first been sold in the 1860s by the Del Valle family to oil entrepreneurs who sought to explore the oil potential of the region. Newhall bought a parcel from the entrepreneurs that stretched 40,000 acres over eastern Ventura County and northern Los Angeles County. As a rancho, the Newhall farm supported a relatively small amount of livestock because of an uncertain water supply. Newhall continued cattle ranching, and began using some of the oil pipelines left behind for water conveyance. He expanded the irrigation, plowing and planting many acres of the ranch. Down river, Newhall used irrigation to render 4,000 acres of chaparral into agricultural land. As one observer noted:

> At the lower end of the ranch (in Ventura County) Mr. Newhall has made a series of ditches, by which he can irrigate some four thousand acres. Here he grows alfalfa and corn in abundance; while he amuses himself with experiments in sugar-cane, flax, Japanese bamboo, and a large variety of tropical and semi-tropical fruits, all of which are doing well.... Newhall has planted over one thousand five hundred assorted fruit trees, including apples, walnuts, peaches, nectarines, plum ... together with a few oranges (quoted in Rolle 1991).

Newhall, a director of the Southern Pacific Railroad, also built a new town south of the Santa Clara River, to serve as a depot for the SPRR. Newhall thus created a transportation network to ship his products to market and a significant way to increase the value of his land holdings along the Santa Clara River.

Urban and Government Interests

The Railroad

In the mid-1850s the federal government developed plans for the construction of the Southern Pacific Railroad which were not executed until the mid-1870s. The main line, completed in 1876, stretched east from Newhall through Soledad Canyon. By 1887 a branch line extended from Newhall west down the length of the river to Ventura (Triem 1985). Initial plans for the Newhall to Ventura branch proposed excavating the south bank of the river near Saticoy "where the excavations and embankment will nearly equalize each other, and probably not exceed twenty feet in depth." The original plans also called for "two spans of 150 feet each" to cross the river at Montalvo, the site of a popular downstream crossing (U.S. War Department, vol. 7 part 1, 1857). As constructed, the Southern Pacific tracks parallel the river bed for the most part. In narrow places in Soledad Canyon the tracks hug the side of the canyon, barely rising out of the river bed. The original tracks were placed on berms constructed of gravel extracted from the river bed.

As well as creating physical alterations in the river, the railroad brought significant economic change to adjacent areas. Before the 1870s, Ventura was the only town along the river, followed soon after by Santa Paula. Towns such as Piru and Fillmore sprang up to intercept the Southern Pacific. Some towns were intentionally planned. For example, entrepreneur Roys G. Surdam designed in 1887 the community of Bardsdale, just south of the river. He laid out the town to include small plots of citrus, and community buildings such as public schools and churches. Surdam and Thomas Bard spearheaded the formation of the Southside Improvement Company in 1887 to provide water for the new town. They purchased water rights from ditch owners and created their own diversion -- the Southside Improvement Company Gravity Pipeline (Triem 1985, Map Showing Irrigation Development 1912).

The arrival of the railroad stimulated a population boom, spurring the growth of agriculture and new industries such as oil. Each constituency had a need for water which was fulfilled primarily with river water. For example when the Limoneira Company was founded in 1893, its directors also formed the Thermal Belt Water Company to provide their new enterprise with water (Triem 1985).

Industries, Government, Urbanization

With increased population and a growing industrial base, urban areas themselves began to extend to the edges of the river. The new industries needed laborers to support them. With less economic and political power than their employers, these laborers often lived on the floodplains of the river. For example in Santa Paula many of the Mexican families, who picked, washed, sorted and packed the fruit for the Limoneira Company, settled next to the river. Not surprisingly, their neighborhood received extensive damage during flooding (McBane 1994, Triem 1985).

As the region diversified, governmental organizations were formed to promote the area's continued economic growth. For example the mission of the Farm Bureau, founded in 1914, was to provide as suitable an environment as possible for crop growing. As cultivation expanded onto the hillsides, rainwater washed increasing amounts of sediment into the valley and river. To address the problem, the Farm Bureau helped organize storm water districts to manage runoff into the river (Gidney 1917).

Roads

Before the extensive development of paved roads in the late 1910s and early 1920s, denizens of the area often used the river bed as a road due to the lack of improved routes. Annual rains turned the river into a place of treacherous quicksands, not only at the mouth but upstream as well. Before the bridging of the river, numerous accounts exist of horses and wagons becoming mired in the quicksand. Thomas Bard was known to dodge the river crossing by waiting at the mouth of the river to "catch the flood tide on the turn and plung[ing] across before the frothing conflict between river and receding waves churned the hard-packed sand into a quivering entrapment" (Hutchison 1965).

Farm families recall crossing the river in special wagons with especially large wheels and wagon beds high above the river's waters (Dickenson 1994). Ventura County helped maintain local roads. A resident of the Oxnard Plain at the turn of this century remembered traveling across the river bottom with her mother who was taking eggs to sell in Ventura. The county had placed hay on the wheel tracks in the sandy bed so the carts would not sink (Olin 1983).

Crossing the upper Santa Clara River provided numerous challenges as well. A local resident recounted a colorful example of a journey through Soledad Canyon in 1905. He accompanied a party of three cars on a trip from Los Angeles to the Owens Valley on an expedition organized by William Mulholland to show the mayor and other Los Angeles city officials his plan to construct an aqueduct. The resident recalled:

> For forty miles we had to fight the railroad for a trail to get through this narrow and wild mountain pass. This put us in the creek bottom most of the time with no sign of a road or trail. The water was running about one foot deep. If a car slowed, as one did, it immediately sank into the quicksand. This necessitated all hands in the caravan to shed shoes and socks and wade in, push, shove, dig and haul for an hour until the car was on solid ground (Strasburg 1994, Heyser n.d.).

Until 1910, the two primary roads connecting the Antelope Valley with Los Angeles were through Soledad Canyon and San Francisquito Canyon. The Mint Canyon Highway, also known as Sierra Highway, was completed in 1921. In 1918 the Sierra Highway bridge over the river was completed (Strasburg 1994).

Section 3

The Industrial Era (1920 - 1990)

Historical Overview

The years from 1920 to the present day reflect the ever-more complex demands upon the Santa Clara River. Agriculture has moved toward agribusiness which has increased water demands on the river and its associated groundwater. As the population of Ventura County and Los Angeles County expanded numerically and geographically, urban development has encroached upon the floodplains. Subsequently residential demands and recreational uses of the river have multiplied. Further, the development of more sophisticated government bureaucracy at the city, county, state and federal levels has had a significant impact on the history of the Santa Clara River Valley. With increased demands on the waters of the Santa Clara River and the lands surrounding the river, efforts to protect natural resources as well as develop human uses have shaped government actions.

Physical Setting

Natural History

Evidence about the changing physical setting of the Santa Clara River comes from a variety of maps, photographs, and reports. The detailed species lists and environmental analysis that goes

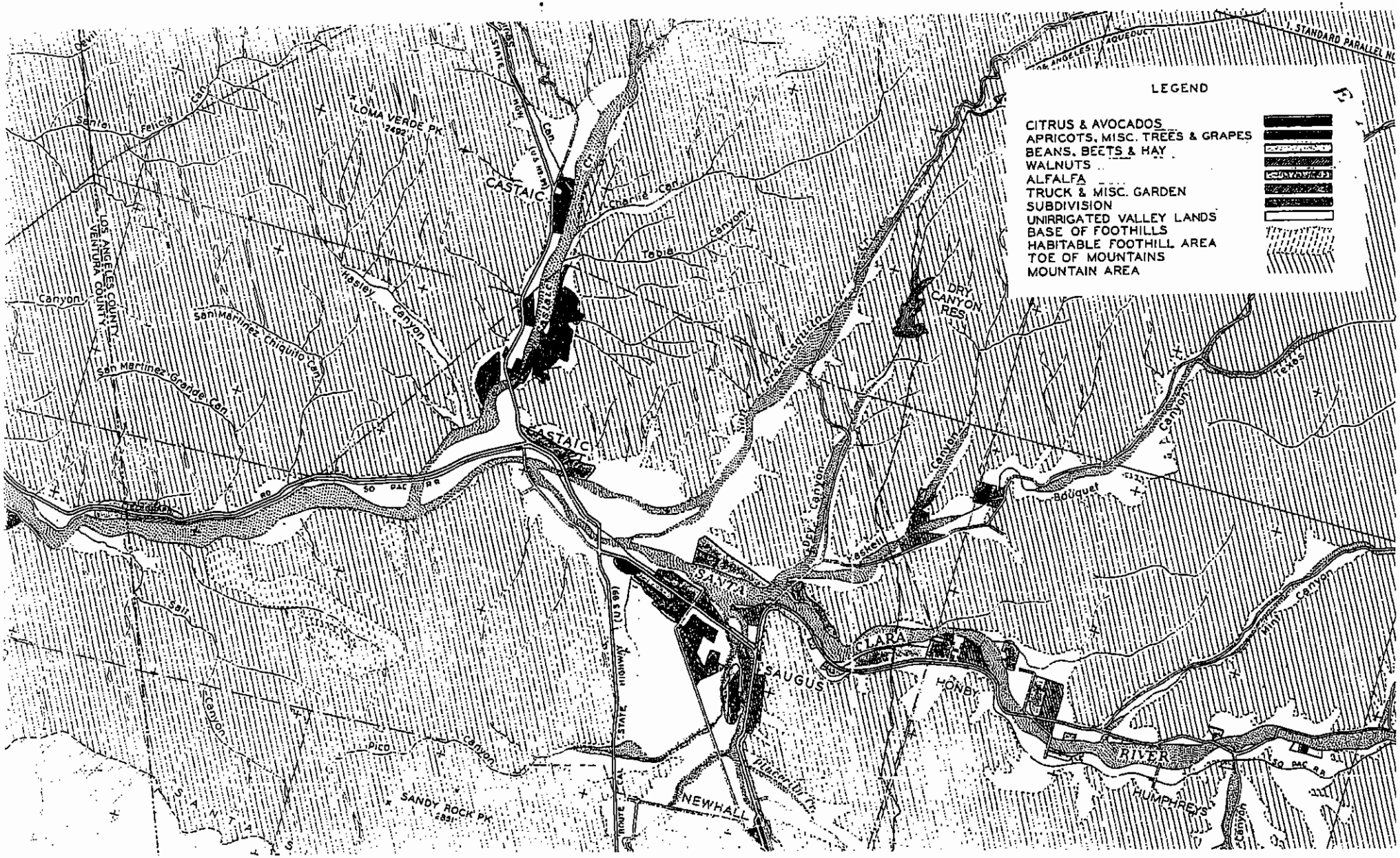

FIGURE 3-1 Mint Canyon 1933 (DWR

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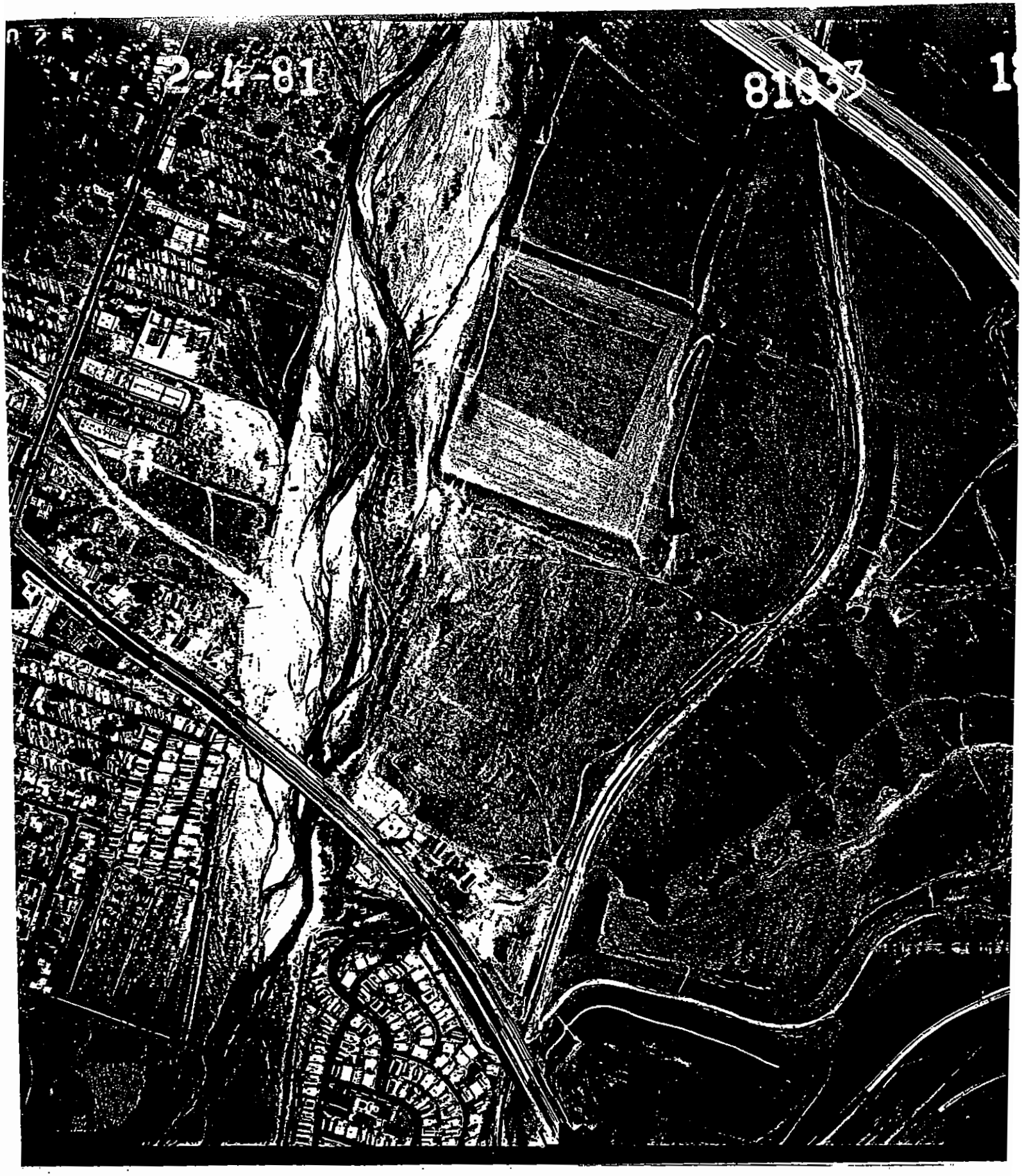


FIGURE 3-2 Mint Canyon/Sierra Highway 1981
(Los Angeles County Aerial Photo 1981)

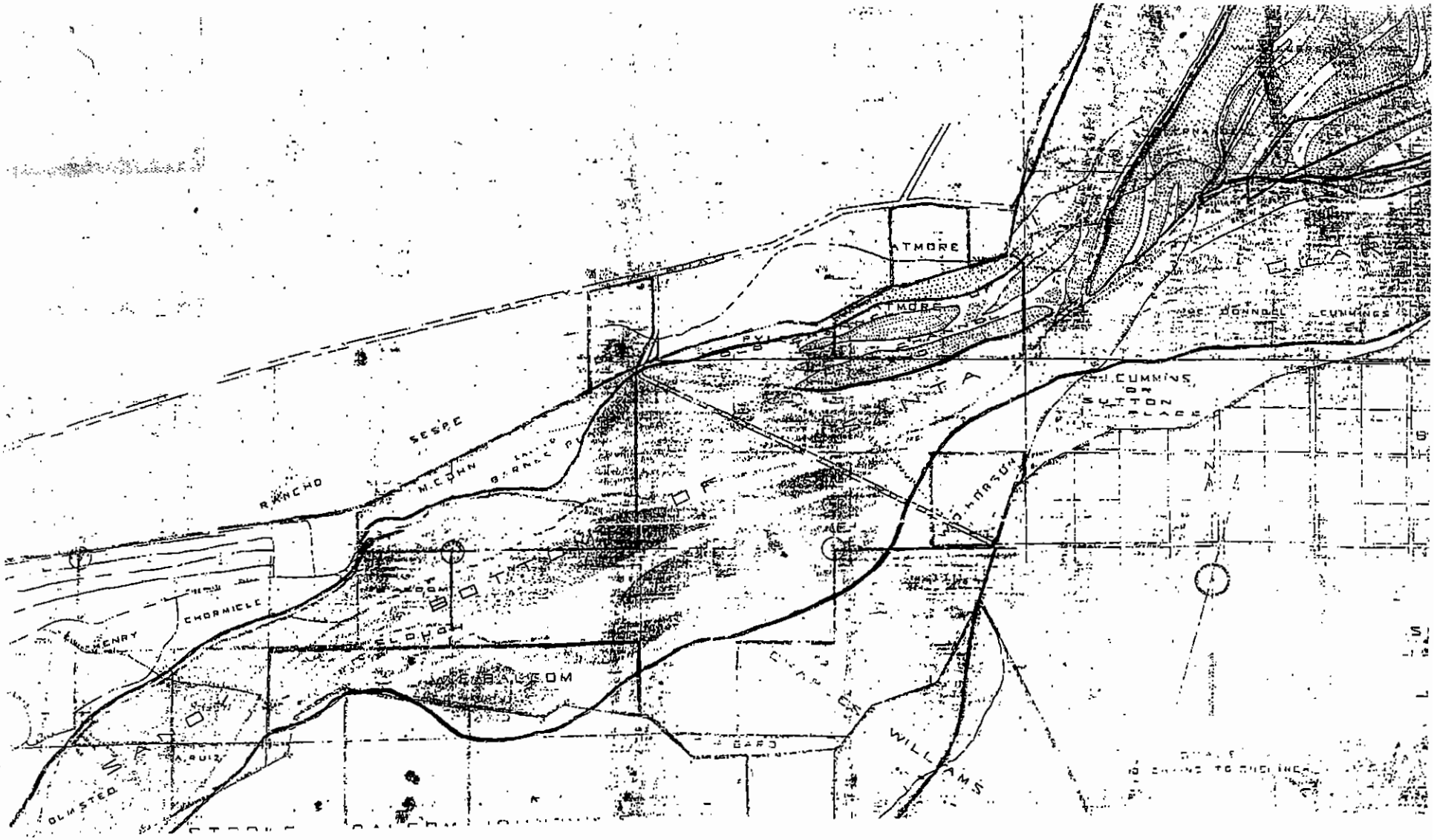
By 1992 this same area on the Santa Clara River between Sespe and Piru Creeks sustained riparian vegetation only along the banks of the river and creeks. These areas consisted primarily of brush sparsely distributed near the channel, followed by wide expanses of sandy riverbed and pockets of riparian associated woodlands (County of Ventura Overlay Series 1992). According to aerial photographs, the major change in vegetation from the 1930s to today is the loss of riparian thickets, once characteristic of the entire riverbed, along gravel bars and floodplain. The lack is noticable especially near aggregate extraction operations downstream, because of lowered water tables from mining and natural scouring (Faber 1989).

Three additional key points along the river were chosen for comparison on the basis of maps and photos available. These include: the Mint Canyon region at Sierra Highway; the confluence of Sespe Creek and the Santa Clara River at Fillmore; and the region below Montalvo Crossing (Highway 101 and SPRR bridges).

For the Mint Canyon region, six sources were compared: USGS maps dated 1900 (San Fernando), 1940 (San Fernando), and 1960 photorevised in 1988 (Mint Canyon), a Division of Water Resources map dated 1933 and aerial photographs from 1968, 1977 and 1981. The 1900 map indicates the railroad following the contour line at the southern bluff of the river. There was no development between the railroad and the north bank, except for unpaved roads. The 1933 map (Figure 3-1) indicates plantings of alfalfa just west of Mint Canyon. By 1940, some structures appeared in the undeveloped area in the plain of the river and the river was bridged at Sierra Highway. In 1968 there appeared to be manmade borders to the river's plain, additional structures and substantial urban development to the north. A 1977 aerial photograph (Figure 3-2) shows a substantial narrowing of the river channel with urban development defining manmade limits on the river (apparently by levee or another structure). A trailer park abuts this apparent levee in an area that appeared to be riverwash on earlier maps. 1981 aerial photographs also clearly display the manmade confines to the channel on both north and south banks just west of Sierra Highway. U.S. quadrangle maps from 1960/1988 confirm development as well as construction of an additional bridge on the new Antelope Valley Freeway. This example shows how regions of the river have become constricted by urban development.

The second example at Fillmore includes a 1838 diseño, a map from the 1860s, two local surveyor's maps from 1894, maps from 1912, 1921, 1923, 1942 and 1951 (photorevised in 1969 and 1974), and aerial photographs from 1993. These maps show the changing morphology of the Santa Clara River as well as the variability of map detail and quality available. In 1838 a crude diseño demonstrated the Sespe flowing in a single channel into the Santa Clara River, although more modern maps show a double channel. Marshy areas at the river's banks were shown in a 1860s general map of the area.

Two maps from 1894--one dated "July and August" (Barry and Isham, Figure 3-3) and the second dated "August" (H.J. Stocker, Figure 3-4)--demonstrate how local farmers altered and made use of the Santa Clara River in this region. In both, the south bank of the Santa Clara dips further south after the confluence with the Sespe, but this bulge in the river's width varies in shape and



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35 FIGURE 3-3 Sespe Creek/Santa Clara River, Barry and Isham, 1894 (Sespe Creek Confluence 18

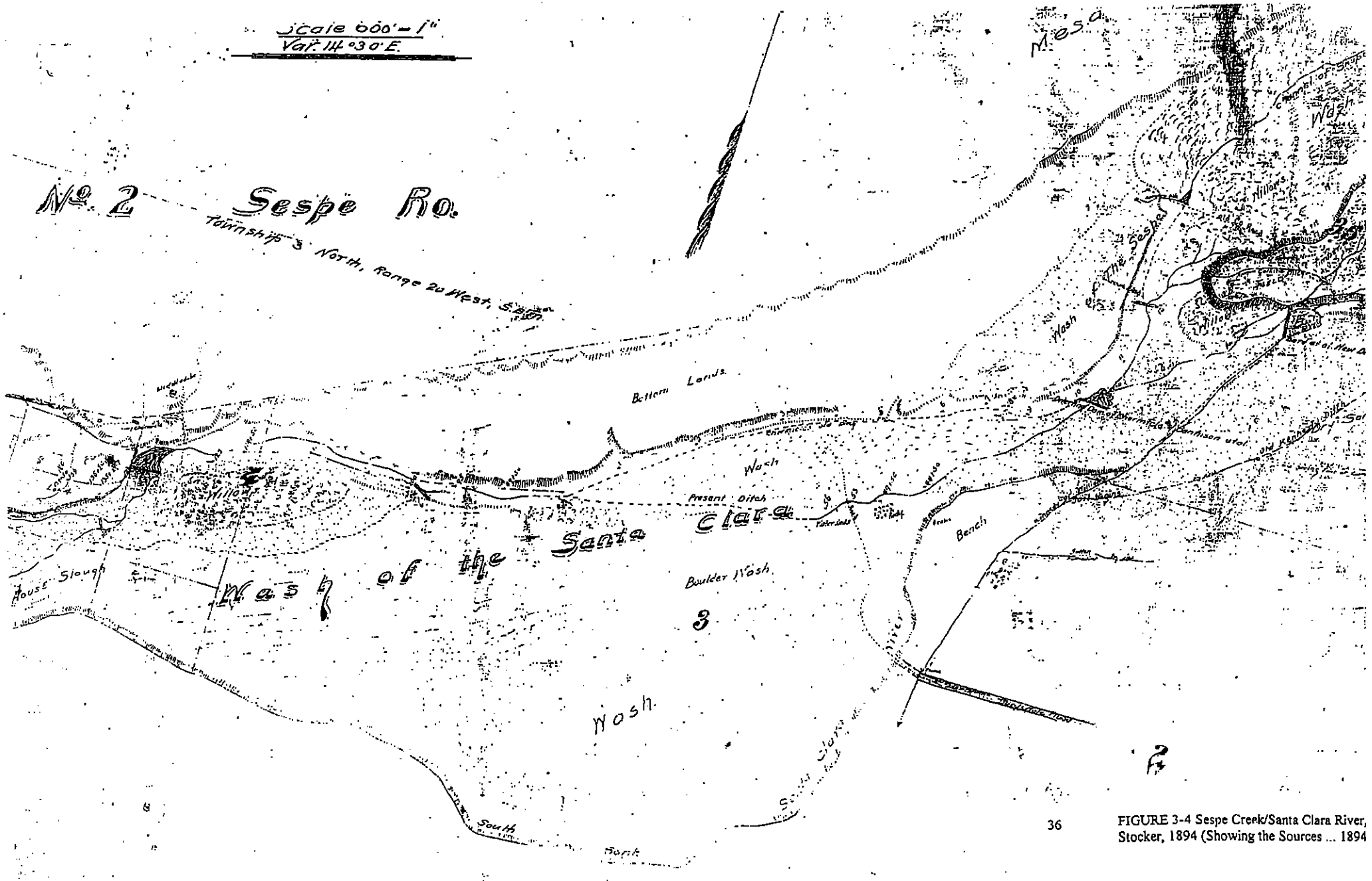

FIGURE 3-4 Sespe Creek/Santa Clara River, Stocker, 1894 (Showing the Sources ... 1894

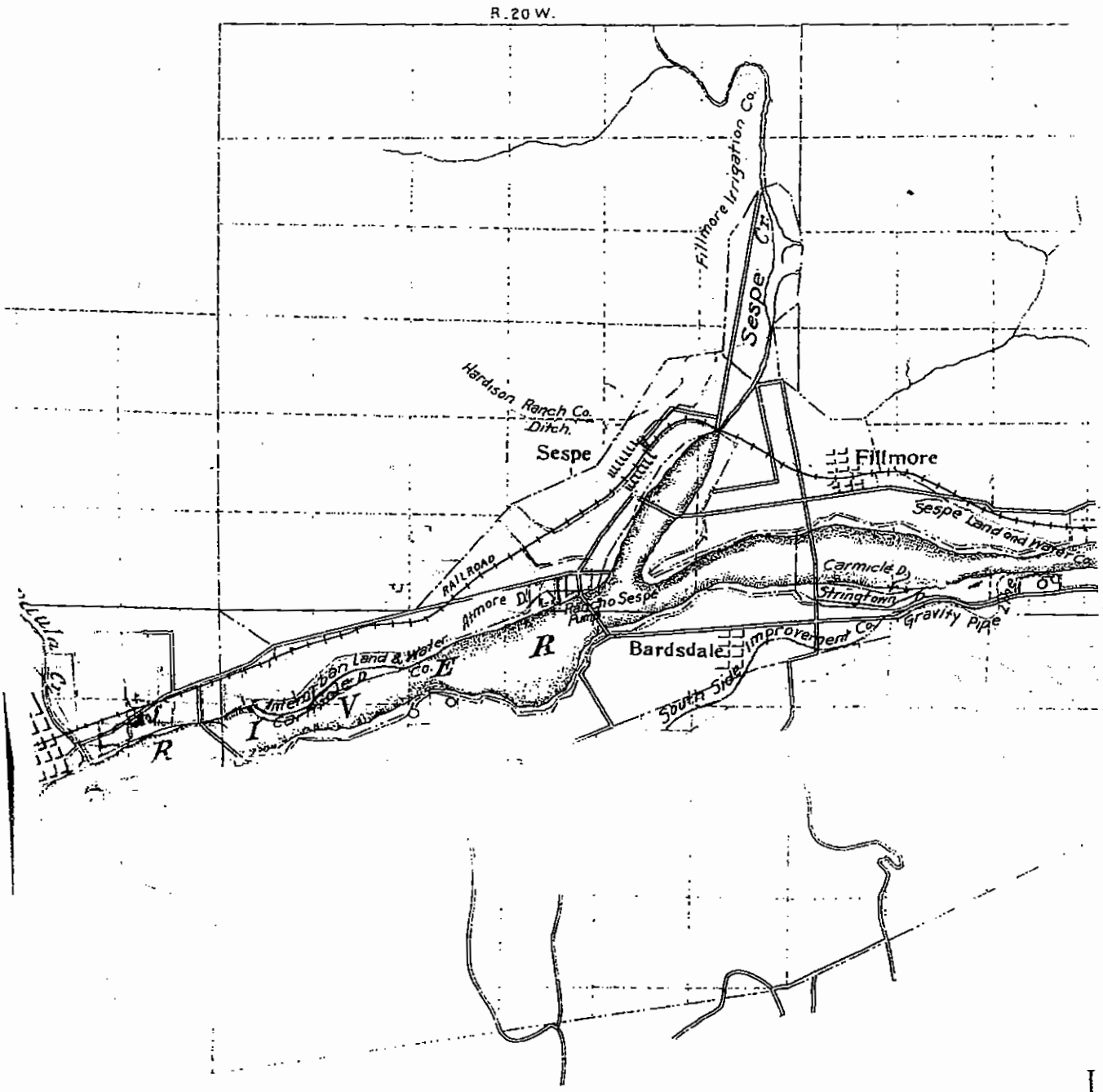

FIGURE 3-5 Sespe Creek/Santa Clara River, (Map Showing Irrigation 1912)

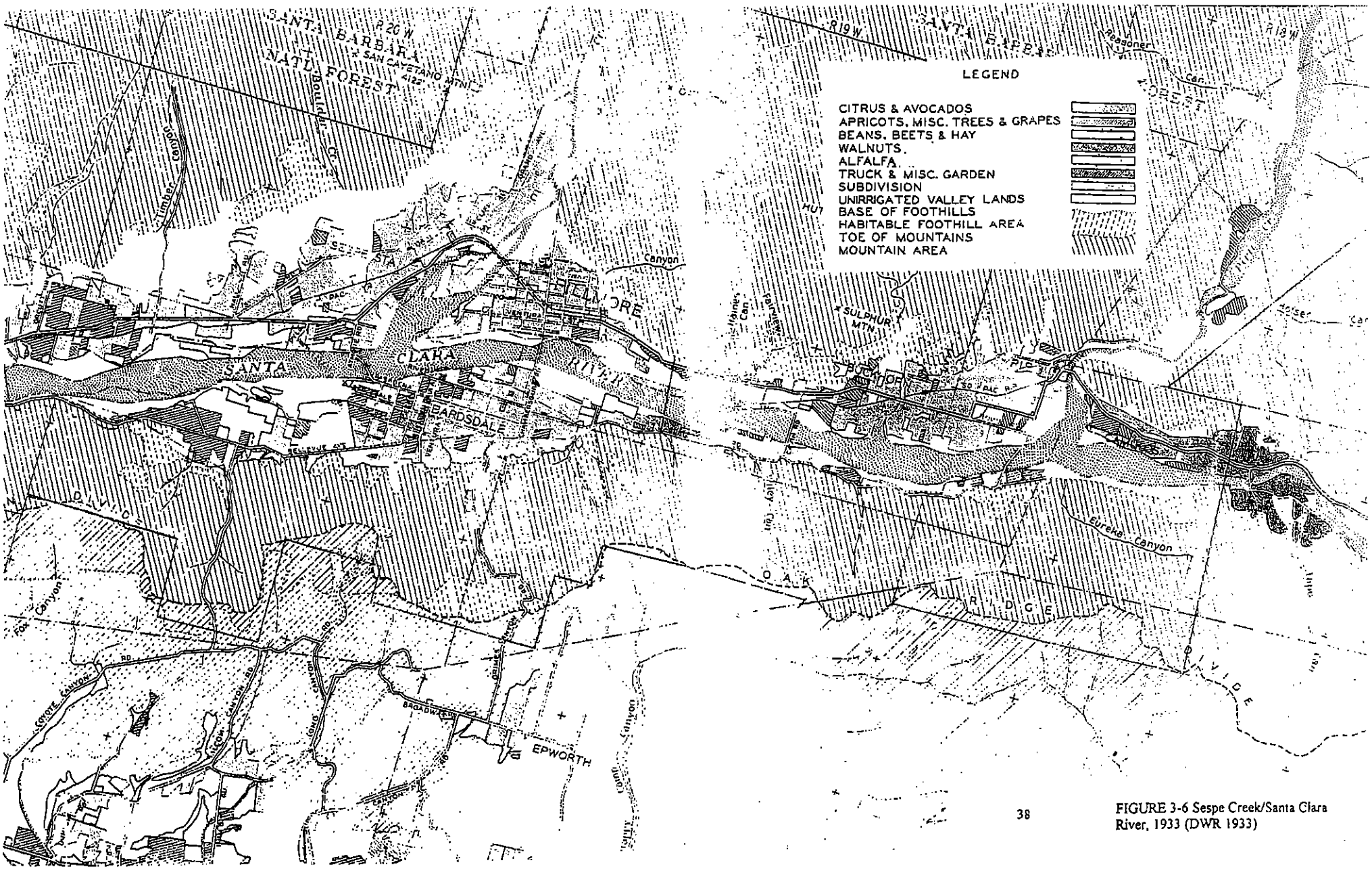

FIGURE 3-6 Sespe Creek/Santa Clara River, 1933 (DWR 1933)

FIGURE 3-7 Sespe Creek/Santa Clara River, 1993 (Ventura County Aerial Photo 1993)

the bank lines are different despite the close dates of the two maps. The Barry and Isham map shows islands and sloughs in the river at places that vary from the Stocker map. The Stocker map shows a number of private dams, reservoirs, irrigation canals and diversions in the river. Further, it indicates large stands of willows downstream from the merger of the Sespe and the Santa Clara. A 1912 map (Figure 3-5) of the same area shows irrigated lands extending to the river banks with a large wide area (comparable to that shown in the Stocker map of 1894) just below the confluence. In 1921, structures appeared in that wide part of the river, and the river bed appeared narrower. The 1933 DWR crop map (Figure 3-6) shows citrus planted to the river's edge in Bardsdale, but mostly unirrigated crop land and some alfalfa adjacent to the widened section of the river to the south. The Santa Clara River appears about half as wide in this area as it did in the 1894 maps. USGS maps dated 1951, 1969 and 1974 show the reappearance of that large wide sandy area, with cultivated lands extending to the edge of the southern river bank. By 1993, an aerial photograph (Figure 3-7) revealed flood protection structures east of the once wide area of the Santa Clara River and the river channel is narrowed.

The third example at Montalvo shows the continuous shifting of river banks and gravel/sand bars within the river. Sources include maps from the 1860s, 1904, 1912, 1914, 1929, 1943, 1947, 1967 and aerial photographs from 1993. The nineteenth century map indicates that a crossing was used where the SPRR and Highway 101 bridges were later built. The map dated August 1914 (Figure 3-8) shows how the bank of the river shifted from 1911 to 1914 (maps from 1904 and 1912 confirm these shifts). The 1914 map also shows human intervention in the river in the form of pilings from the SPRR bridge downstream in the middle of the river channel and some early bank work. The 1929 map (Figure 3-9), made after the St. Francis dam disaster, shows several southern banks of the river and a large amount of manmade interventions such as pilings, groins, jetties and levees along the south bank and in the river itself. Land in the river bottom is marked as pasture land, with some areas that appear to be contained within the 1914 banks marked as cultivated. The Santa Clara Rock & Sand Co. plant is visible on the Ventura side.

Later USGS maps of the Montalvo region show constant shifts between wet and sandy areas within the river's banks. By 1947, a south bank levee is clearly visible on the USGS maps, confirmed by aerial photographs. This levee narrowed the river channel and the south bank was pushed far north from its 1911 and 1914 boundaries. The 1967 map shows a golf course (River Ridge) in an area that appeared to be within the river's banks in historic maps from 1904, 1912, 1914 and 1929. The shifting banks of the lower river can be seen in many historical aerial photographs from Saticoy to the ocean, which show "scarring" of agricultural land left by earlier braiding of the river channel. These variable banks are confirmed by the maps of the Montalvo area described here. The 1993 aerial photographs (Figure 3-10) show a river channel substantially narrowed by levee.

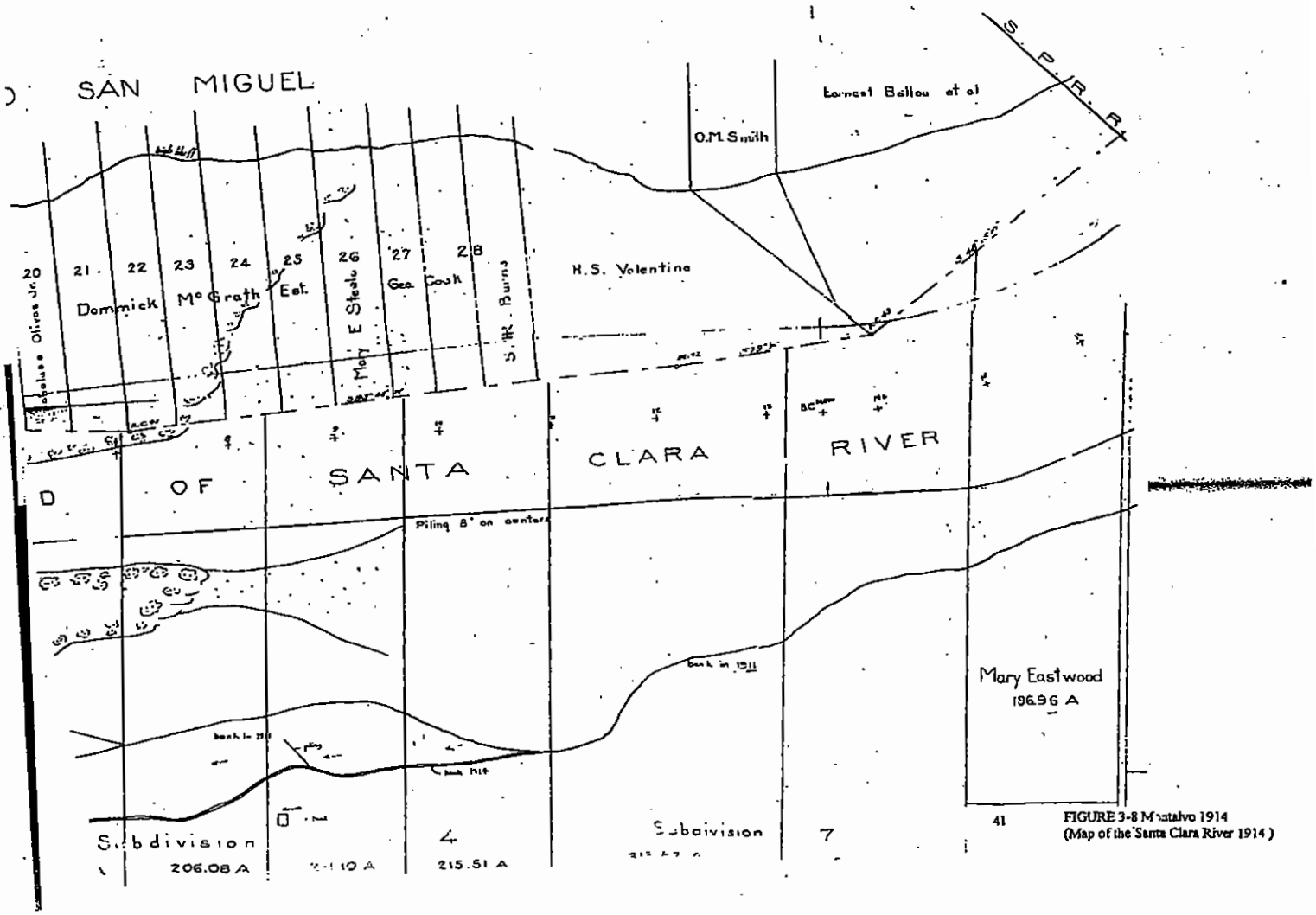

FIGURE 3-8 Montalvo 1914
(Map of the Santa Clara River 1914)

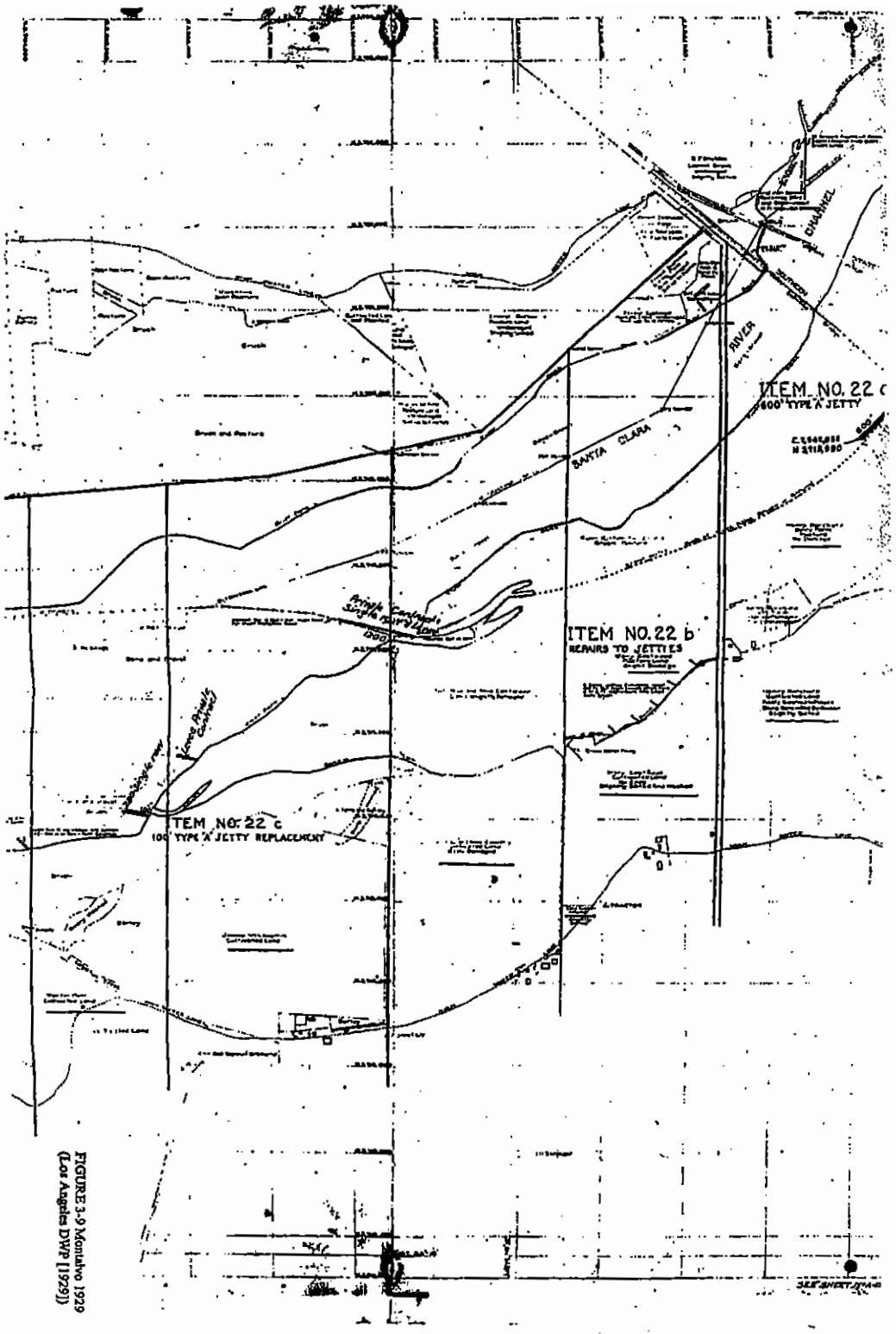

FIGURE 3-9 Montalvo 1929
(Los Angeles DWP [1929])

FIGURE 3-10 Montalvo 1993
(Ventura County Aerial Photo 1993)

Floods

Flooding before 1920 is discussed in the earlier sections of this report. The next dry phase ran from 1918/19 to 1933/34. This era saw the increased use of ground water in the Santa Clara River Valley. With the drought and ground water development came decreased water levels in underground basins (Freeman 1968).

Medium flooding in 1932 resulted in the undermining of the several bridge piers in Montalvo, the flooding of a rock and gravel plant on the Piru Creek, and other damage (U.S. War Department 1945).

While not a naturally-occurring flood, the St. Francis dam disaster wrought flood havoc on Los Angeles and Ventura Counties. The dam, begun in 1924, was built by the city of Los Angeles as a storage reservoir for the Los Angeles Aqueduct. As noted in the "Government" section of Part 3, some Ventura County residents protested the dam because of its possible effects on the Santa Clara River watershed. No one anticipated, however, how the dam was to affect the river valley. On March 12-13, 1928, parts of the St. Francis Dam gave way, sending a huge surge of water down the river valley and creating one of the worst disasters in California history. The dam gave way just before midnight on March 12 and by 4 a.m. floodwaters reached the Saticoy bridge.

The exact loss of human lives will never be known, but at least four hundred people died. Property damage was massive, with water destroying or moving homes, other buildings, orchards, bridges, farms, roads, irrigation lines and canals. In Los Angeles County, valley land was stripped bare. "The forests of river growth--willows, creek alders, and cottonwoods--were either gone or crushed and buried with debris" (Outland 1977, 154). At Blue Cut, the narrowing of the river valley created a near "whirlpool" and washed out a camp of Edison workers, killing over 80.

In the citrus and walnut groves from Camulos to Fillmore, trees were flattened or covered with silt. Aerial photographs, panoramic photographs, and maps demonstrate the extent of damage and the flood line. The force of the floodwaters diminished downstream, but still were quite destructive. Nearly 8000 acres of agricultural land was flooded within Ventura County, with over a third of land being pasture. The unusual breadth of the flood covered agricultural lands that were normally well protected from routine annual flooding, so some citrus and other tree crops were lost and fields crops damaged as well. Photographs taken from the ground and air clearly demonstrate the severe silting that covered farm land. A series of maps that indicate plans for flood control measures (drawn by the Los Angeles Department of Water and Power in 1929) also indicate where severe damage and sedimentation took place in Ventura County.

The dam disaster was a unique event that had a profound effect on the river valley and its residents. Local farmers still point to places where they believe the floodwaters reshaped the topography of farmlands adjacent to the river bottom and created new benches (Taylor 1994).

The dam disaster was not a part of the "natural history" of the river in that it was neither a natural feature nor a repeated response to a manmade intervention. It does clearly demonstrate, however, the potential side effects of manmade structures. After the flood, the Santa Clara was no more "fixed" a river as it had been in the past. Yet for the first time, government began to provide significant flood control assistance to individual landowners.

Table 3-1
Estimates of flooded agricultural land (Ventura County), St. Francis Dam disaster 1928

Crop	Acres
Citrus	1554
Walnuts	367
Apricots	287
Beets, beans, hay	1289
Alfalfa	675
Vegetables	505
Pasture Land	2915
Grapes	17
Vacant land "that could be used for vegetables"	293
Total	7902

Source: Teague 1944

The 1938 Floods

The wettest phase on record followed from 1934/35 to 1943/44. The massive floods of March 1938 resulted in great damage throughout Southern California, with Ventura County costs estimated at $2.5 million. Homes were destroyed and several hundred acres of productive agricultural lands were damaged or destroyed. The Fillmore Herald recorded that "many ranches located in the path of the flood waters suffered heavy damage from flooding of trees, especially in the lowlands near the rivers" (ACE 1972). The Saticoy bridge lost two spans, and the Newhall Ranch bridge east of Piru was destroyed (War 1945). At the mouth of the river, the Bard Beach Road bridge was damaged. Castaic Bridge was damaged and the state highway was closed east of Camulos Ranch. Camulos Ranch lost its intake concrete pipeline. The Herald reported that "Many majestic oaks and sycamores could be seen floating on top of the mad waters" (ACE

1973).

In Santa Paula, flood waters of the Santa Clara reached "automobile flood board level" at Eighth and Harvard Streets, and bridge approaches were washed out at a variety of Ventura County locations (ACE 1968). Some Santa Paula homes were moved from their foundations, the city sewage plant was destroyed, and the channel of Santa Paula Creek filled with debris. Railroad damage--the most extensive since the building of the Southern Pacific line in 1876--was most significant above Saugus, with 7 of 11 Soledad Canyon bridges moved off their foundations and the remaining buried under debris and silt or with destroyed approaches. Most highway damage was above Piru, but most agricultural damage occurred downstream of Piru. About "3,900 acres of improved farm lands were inundated and 360 acres were destroyed by bank erosion" (U.S. War Department 1945). The 1938 flood was comparable to the 1914 and 1916 floods and probably not as major as the 1862 and 1884 flooding.

The Floods of 1969

From 1944/45 to 1964/65 ran a drought period. 1969 brought the worst recorded flood on the river, with damage accelerated by the river bed degradation caused by gravel mining (VCFCD 1983). Upstream, the Sespe washed out the SPRR trestle and washed over fields, orchards, and a housing tract. At least 3000 acres of orchards were flooded, and other lands damaged from mud slides. Fillmore's sewage plant was damaged. 1969 also brought damage or destruction to a number of bridges, including the Saticoy bridge. The Army Corps of Engineers-designed flood control levee from Saticoy to the 101 Highway barely contained the river's flow toward the Oxnard Plain. In the second major set of floods for the year, the river's mouth turned northwest and flooded the Ventura Marina. While there is no single good map of the flood, aerial photographs clearly show the extent of the flooding.

Fires

Fires have regularly affected the vegetation in the Santa Clara River watershed and increased the load of silt and debris carried by the river. For example, the Matilija fire of 1932 damaged 139,000 acres of cover on Sespe and Santa Paula Creek watershed and resulted in silting that closed down the Santa Clara Water Conservation District's water spreading efforts for that water year. Although this report does not provide a comprehensive fire history for the watershed, it should be noted that fires have had an effect on the river's flow and morphology.

Government control over the river became much more extensive in the years after 1920, and came in a variety of forms. Local, state and federal interests overlapped and mixed with private interests. Two major "public/private" uses of the river--bridges and landfills--are discussed in separate sections below.

Government control began with the need to resolve conflicting demands on the water resources of the Santa Clara River Valley. In 1920, the federal government supported the view that the Santa Clara River could clearly meet the demands placed upon its waters. In a U.S. Department of Agriculture soil survey report published in 1920 the Bureau of Soils announced, "The supply of water for irrigation is ample for the present needs of the area..." (USDA 1920) Yet that view was not to hold for long, as landholders in the watershed began to fear encroachment by the demands of outside users and became aware of increased local usage as well.

The 1920s and 1930s

Local Government: Irrigation and Drainage

Starting in the 1920s, local and regional bodies exerted the most government control. Increased agricultural and urban development led to new forms of government intervention, often in support of ranchers and business interests. Local irrigation districts, created under laws authorizing special district formation, took over from individuals the tiling and drainage work that private citizens demanded as improvements on agricultural land. (The significance of these districts is discussed in the "Agriculture" section of this report.) Many of the early local government interventions in the river were directed by the same agricultural interests and significant individuals that peopled the boards of local irrigation companies and municipal governments.

Water Rights

Water rights on the Santa Clara River reflect the complex evolution of water rights doctrine in California. Water rights issues are settled by the state. Appropriative rights were essentially created by early gold miners. Some users along the Santa Clara River had (and continue to hold) riparian rights, which recognize preference in water use to landowners along the stream. Other users began to apply for appropriative rights. (The conflict between these two types of rights was settled by the California Supreme Court in 1886 in *Lux vs. Haggin*, which generally favored riparian rights. Riparian rights that went unused, however, were subject to change. In 1928, the state constitution was amended to reflect the principle of reasonable use, applying to riparian rights as well.) Some users of surface water from the Santa Clara River continue to hold riparian rights.

Competition for Santa Clara River Water

The early twentieth century is remembered in California water history mainly for the drive for water resources to support the growth of the Los Angeles area. Representatives of the Santa Clara River Valley, which is shared by both Ventura and Los Angeles counties, were players in this political forum. One early proposal was to export Piru Creek water to the Antelope Valley, for example; this plan never came to fruition.

By the mid 1920s, however, the state of California had received applications for use of the Santa Clara River drainage basin from five organizations, some from outside the Valley itself. For example, the Ventura Power Corporation wished to appropriate surplus water from Sespe and Piru Creeks, as did the Sespe Light and Power Company. Applications were also filed on the Sespe Creek by the proposed Ojai Irrigation District and the Moorpark-Conejo Irrigation District, and on San Francisquito Creek by the City of Los Angeles (Freeman 1968).

Private Intervention

Alarmed by the potential for these increased demands and possible exportation of Santa Clara River water resources, the Santa Clara River Protective Association (SCRPA) was formed in January 1925. C.C. Teague, one of the most significant economic and political figures in Ventura County history, was elected chairman.

The Protective Association was a private organization supported by agricultural interests and was not supported by the three municipal governments in its purview. It received additional support from local oil and refining companies and gravel/aggregate manufacturers. The association funded itself with a 25-cent-per-acre contribution by owners of over 49,000 irrigated developed agricultural land in the region. Members were appointed from Piru, Fillmore, Bardsdale, Saticoy, Oxnard, Ventura and Santa Paula, and the committee was "empowered to act for water-rights owners at hearings of the Ventura Power Corporation before the State Division of Water Rights" in February of that year (Freeman 1968, 85). In essence, the water-rights owners who demanded representation were the same individuals as those who formed SCRPA. Nonetheless, the SCRPA had no legal standing, so protests were filed by organizations that tied into the interlocking networks of agricultural interests in the valley: the Santa Clara Water and Irrigating Company, Alta Mutual and Community Mutual Water Companies, and Farmers' Irrigation Company.

Water Supply Investigation

The SCRPA also commissioned C.E. Grunsky to investigate the water resources of the valley. By August 1925, Grunsky's report stated that "there will be no surplus water available for diversion away from the main valley and Oxnard region" except in times of heavy rain, and that even those surpluses could not be used "without detriment to the interests of the Santa Clara River region." (Freeman 1968, 88)

Grunsky also reported that 84,000 acres would require irrigation for cultivation, with 40,000 of these acres in the Oxnard Plain. Local irrigating and canal companies reported irrigation of 35,000 acres with use of 2.46 acre feet of water per acre annually (over 28 billion gallons per year). While the drainage basin's average production was nearly twice the demand, much of the production was flood waste. During dry seasons, however, water production would not meet the demand for irrigation.

The association also requested the California Department of Public Works undertake a water resources survey, and the State Division of Water Rights agreed to postpone decisions on the existing water rights applications until the survey was completed (Freeman 1968). This survey became the Ventura County Investigation, which was published by the Division of Water Resources in 1933 and became the guiding force behind local and state policy in the Santa Clara River Valley for many years.

Releasing Stored Waters

Meanwhile, the City of Los Angeles applied to more than double the water requested in its application for surplus waters of San Francisquito Creek. The SCRPA and the Newhall Land and Farming Company worked to have the City of Los Angeles agree to release water from the St. Francis Dam (completed in 1925 before hearings on the protests were held).

In a famous test intended to show that 50 second-feet of water from the reservoir would flow down the San Francisquito Creek to the Santa Clara River, Los Angeles Power and Water Division's chief engineer William Mulholland organized a release from the St. Francis Dam. All of the water percolated beneath the stream bed and none of the 775 acre-feet released in the test ever reached the Santa Clara River channel as surface flow. The results of this test, which were far from what Mulholland predicted, led to further delay of water-rights litigation (Outland 1977).

However, the issue of water rights on San Francisquito Creek was obviated in 1928 with the collapse of the St. Francis Dam. Although the result of this dam failure is not considered a natural flood event, it will be considered with other floods in the sections following.

Public Intervention

The 1928 St. Francis Dam disaster, besides significantly altering the physical contours of the river valley, prompted local government agencies to intervene in the river. The City of Los Angeles worked quickly with representatives and landowners of Ventura County to settle claims. Maps from the City of Los Angeles Department of Water and Power, showing the extent of flooding, also indicate plans for the construction of protective levees and groins. Many of these structures throughout Ventura County, such as structures at Fillmore and downstream of the Montalvo (Highway 101) bridge, were apparently built by the City of Los Angeles. They are among the earliest public works along the Santa Clara River, besides bridge protection, built by government

to protect landowners along the river and control flood flows. The Ventura County Flood Control District has repaired some of these levees and groins in the years since 1960.

Percolation Basins

A final interest of the voluntary organization known as the Santa Clara River Protective Association was the spreading of water to replenish groundwater supplies. As no state law enabled the creation of a district to accomplish such a task, the committee instructed an attorney to draft a bill. Assembly Bill No. 233 was passed by the state legislature and became the Water Conservation Act of 1927. Under authority of this law, the Santa Clara Water Conservation District was formed in 1927. The SCWCD included 110,000 acres in the Ventura County's section of the river valley and the Oxnard Plain, excluding incorporated Oxnard, Santa Paula and Fillmore. Directors included members of local agricultural families such as Donlon, Petit and Teague. Later directors included members of these families and other leading Ventura County ranchers (Freeman 1968, UWCD clippings files).

The district's first operations included water spreading, which had been practiced in other regions of Southern California since the 1890s. The SCWCD began its spreading at the Saticoy Spreading Grounds because of lowered well levels in the Oxnard Plain. In 1928-29, the district began diverting Santa Clara River water from near Saticoy, although the St. Francis dam failure delayed the start of operations until 1929. Presumably, the dam and reservoir indicated in the flood damage maps located at the Ventura County Historical Society represent the SCWCD's earthen dam and intake operations on the river, which used the Santa Clara Water and Irrigating Company canal to carry river water to the spreading grounds.

In 1930 the SCWCD began diversion of water from Piru Creek to the Piru Spreading Grounds, and in 1931, the district began diverting water from Santa Paula Creek to the Santa Paula Spreading Grounds. The district also carried out other operations in the Santa Clara River bed itself. "In a number of locations the river channel was scarified and small contour ditches plowed to induce percolation" after rains. (Freeman 1968, 99) There are photographs of this scarifying of the river channel with heavy machinery near the Saticoy bridge in the early 1930s.

Concerns About Appropriations

In 1930, reacting to an the announcement that Los Angeles planned to build a dam in Bouquet Canyon, the district raised questions about the use of Santa Clara River watershed water resources and the safety of another upstream dam. The Los Angeles Department of Water and Power assured SCWCD's directors that the construction of the dam would be safe and that the dam would not claim any rights to the watershed's water but would be used for storing waters of the Owens River Aqueduct. The two parties negotiated a water release contract, which continues to exist between the Department of Water and Power and SCWCD's successor, United Water Conservation District.

Dam Proposals

During the 1930s, the SCWCD investigated dam sites along Piru and Sespe Creeks and expressed concern about potential sea water intrusion into wells on the Oxnard Plain. SCWCD expressed interest in dam sites at French Flats and Los Alamos (now Pyramid Dam) when the state highway division planned to extend Highway 99 across both sites. From the mid 1930s to mid 1940s, a combination of wet years and major water releases (beyond those required by agreement) from the Owens River Aqueduct into the Santa Clara River basin quieted public demand for water conservation (Freeman 1968).

State Involvement

In 1933 the California Division of Water Resources published Bulletin 46, the Ventura County Investigation. Besides providing basic geological information on the river basin, Bulletin 46 described the projected water demands for the region and suggested a variety of development plans. Rejecting reservoir sites as excessively costly, DWR suggested additional spreading grounds and the creation of underground capacity in the Santa Paula Basin by extracting water. The Ventura County investigation suggested the removal of willows from the riverbed to conserve water. Water levels in the river valley, suggested the report, were so high that they supported 3700 acres of willow even after several years of drought. Reported the Division of Water Resources: "The willows are wasting about 40% as much water as is being beneficially consumed in the valley" (Division of Water Resources 1933).

Other state agencies were involved in river-related issues during these years as well. The California State Department of Fish and Game issued a fisheries report for the river in 1938, and in the early 1940s the State Fish Hatchery at Fillmore was opened. The fishery initially used surface water but by 1948 had to resort to the use of well water (Wolf, in Freeman 1968, 24-25).

Government Involvement Increases

During these years, other government agencies began to regulate and control the river. On the federal level, the War Department (and then the Army Corps of Engineers) developed plans for a levee between South Mountain and Highway 101 by the end of World War II. On the local level, flood protection work and "channel changes" apparently were carried out from the turn of the century to the 1930s by the county. The Ventura Country Flood Control District was established in 1944 and the Ventura County Board of Supervisors authorized the development of a comprehensive water control and conservation plan. The Zone 3 report, published in 1946, suggested that water for the Calleguas Creek basin be imported from the Sespe Creek. The Zone 2 report, which covered the Santa Clara River area, said that Zone 2 had no need of surface storage because of sufficient groundwater supplies, but that a Sespe Creek dam, specifically at Topa Topa, was crucial for the Zone 3 and that Zone 2 may need to supply future needs of Zone

1 in the Ojai and Upper Ojai Valleys. The Zone 2 report further suggested that control of the Sespe Creek might result in improvements in water quality particularly helpful for citrus crops.

The Santa Clara Water Conservation District vigorously fought the recommendations of the VCFCD reports. The SCWCD commissioned Harold Conkling to write on "The Water Supply of the Santa Clara Water Conservation District." This report emphasized the overdraft of groundwater supplies and the increase in local demand for water. Conkling recommended construction of storage reservoirs on the Santa Clara's tributaries. In 1947 SCWCD filed applications to appropriate waters of the Santa Paula, Sespe and Piru Creeks and Santa Clara River; there were applications for municipal use, domestic use, irrigation, and industrial uses. In 1949, the Ventura County Flood Control District Zone 2 filed a similar set of applications for water appropriation, but withdrew the applications in 1955. The Calleguas Municipal Water District (VCFCD Zone 3) also filed on Sespe Creek in 1949 and in 1952 requested the federal Bureau of Reclamation to begin investigations for dams.

In 1949, SCWCD's Vern Freeman suggested to that agency's board that Oxnard city water system be changed to a variable rate system to save water, that ranches on the Oxnard Plain use concrete pipe rather than open ditches to transport well water to fields and that duck clubs along the Santa Clara River used significant and unjustifiable amounts of water. Despite considerable political controversies, some changes were made: Oxnard installed water meters and duck clubs reduced their use of water (Freeman 1968).

New Dam and River Projects

The Santa Clara Water Conservation District was succeeded by the 1950 formation of a new special district, United Water Conservation District, under the California Water Conservation Act of 1931. UWCD continued investigations of dam sites and water conservation measures and unlike SCWCD was authorized to secure funds for the construction of major projects. After considering sites on Sespe and Piru Creeks, UWCD decided to build dams at the Topa Topa site on Sespe Creek and the Santa Felicia Dam on Piru Creek. However, a bond issue to finance both dams failed (UWCD clippings files).

A more limited bond election approved the funds for a single dam, and UWCD built the Santa Felicia Dam on Piru Creek. The dam was completed in 1955. At the same time, UWCD continued to develop the Lower River Project, built from 1954 to 1956. The Lower River system included an improved diversion at Saticoy, new spreading grounds at El Rio, a Pleasant Valley diversion line and reservoir and a pipeline to Oxnard and Port Hueneme. UWCD continued operations of its spreading grounds and Saticoy diversion. Increasingly, however, the bulldozed earth diversion was washed out by heavy rains, thus allowing water that UWCD intended to store in groundwater basins to flow to the ocean instead. Repair work restored the earthen dam but often at a high annual cost.

Flood Control Projects

The Army Corps of Engineers issued final reports and plans for the levee from South Mountain to the freeway in 1958. In 1961, construction of the rip-rap (stone revetted) levee was completed with federal funds, and an earthen berm was extended downstream to the present site of the Victoria Avenue bridge between Ventura and Oxnard. (After the construction of the Victoria Avenue bridge in 1976, that berm was developed into a levee.) That the levee blocks the river from places where water historically flowed can be seen from aerial photographs, which show evidence of past river braiding in the region south of the structure. The levee is maintained by the Ventura County Flood Control District. At about the same time as the major Santa Clara River levee was constructed, the Saticoy Auxiliary Dike, protecting Cabrillo Village, was planned and built. VCFCD also maintains dikes along the lower portion of Santa Paula Creek (VCFCD 1983).

Pilot Channeling

Ventura County Flood Control District also restructured the river in a variety of ways. Pilot channeling, or the excavation of stream channels within the river bed, was a regular practice in the river. For example, the Ventura County Department of Public Works report to the Board of Supervisors published in June 1959 recorded that 1950 linear feet of river bed was affected by pilot channels, which moved 42,300 cubic yards of riverbed materials (DPW 1959a). The following quarterly report, from July to September 1959, indicates that upstream from the UWCD headworks, a channel one mile in length with "a cross-section about 300 feet in bottom width" was completed. This channel was intended for flood control as well as assisting diversion operations at Saticoy (VCDPW 1959b). In addition, the same report recorded that VCFCD was at work on a three-mile pilot channel upstream of Willard Bridge in Santa Paula. The annual report for 1959 indicated that 24,215 linear feet of channeling was carried out in the Santa Clara River, with removal of 529,400 cubic yards of materials. Additional pilot channels were dug in Sespe and Santa Paula Creeks. The 1960 report indicated that pilot channels were created or redug in a variety of places, including in the Santa Clara River from Willard Bridge to Balcom Canyon Road, approximately 13,000 linear feet (VCDPW 1960). Annual reports clearly mention pilot channel work throughout the early- to mid-1960s. Aggregate extraction companies were apparently given permits to maintain pilot channels as well. Other specific projects were carried out in the late 1960s and 1970s.

Drainage

Ventura County Flood Control District controls a number of significant drainage outlets into the river. It maintains all drainage districts in the county, whether urban or agricultural, with flows over 500 cfs. The VCFCD also placed concrete linings in a number of barrancas and drainage areas over time.

Additional Flood Control Projects

The Ventura County Surveyor's Office houses plans of work done by VCFCD. Projects include repairs to rock groins at the river banks (such as those near Briggs School, the Santa Paula Airport, Sycamore Rd., and behind the Ventura municipal golf course on Olivas Park Drive, dated 1973). Work to repair and augment existing levees includes construction of rock groins at the south bank of the river at Bardsdale and upstream of the confluence with Sespe Creek (dated April 1973). Plans for similar work were drawn in 1969 (after major flooding) although records of construction do not accompany the plans.

Permits and Aggregate Extraction

VCFCD is one of several county agencies issuing permits for work in the Santa Clara River. The earliest permits were issued in the early 1960s and included permits for pipeline crossings, construction of haul roads, sedimentation ponds and storm drains, and removal of borrow from the riverbed. The majority of permits for work in the river allow removal of riverbed material and alluvium. County permitting of the sand and gravel mining industry accelerated in the early 1970s, and state and county intervention in aggregate extraction is a prime example of government involvement in the Santa Clara River. Gravel mining in the Santa Clara River changed forever with the studies and conditional use permit reports of the 1970s and 1980s. In 1975, California passed the Surface Mining and Reclamation Act, intended to protect access to significant mineral resources and require reclamation of lands used in aggregate extraction. State law required that operations extracting over 1000 cubic yards must reclaim areas through grading and planting. In 1980 Ventura County began its Mineral Resource Management Program, with the State Division of Mines and Geology conducting a resource survey. Ventura County created a "red line" to limit mining in the river. At first, the line followed from the top of the footings at the Santa Paula Bridge to the top of footings at the Montalvo Bridge; more sophisticated studies and projections have resulted in the modification of that level (Collart 1994; VCFCD 1993).

Local Conflict: Sespe Creek Appropriations

Conflict with the Calleguas Municipal Water District over use of Santa Clara River watershed resources for the eastern section of the county continued through the 1950s and 1960s. In 1956 UWCD rejected Calleguas's proposal for a joint project, and later that year UWCD filed protests to Calleguas's application to appropriate Sespe Creek waters. UWCD eventually filed protest to the State Water Rights Board decision favoring Calleguas, Calleguas moved to import Metropolitan Water District water in 1960, and in 1963 the State Water Rights Board denied Calleguas's application to appropriate Sespe Creek waters. Meanwhile, some municipalities moved to solve the demands of increased urban water use by using resources outside the Santa Clara River watershed. As Calleguas Municipal Water District had done in the early 1960s, Oxnard began importing Metropolitan Water District water in 1965.

In 1957, UWCD announced plans to develop additional dam sites on the Sespe and Piru, and continued to promote dam proposals with the approval of its application by the State Water Rights Board. The Bureau of Reclamation produced a reconnaissance study of the Sespe Creek Project in 1964 and a feasibility report in 1966, but public controversy about the project and particularly about potential damage to California condor habitat mounted. In 1966, plans for UWCD dam development on the Sespe were halted by voter rejection of the proposal.

Environmental Regulation

Environmental concerns became an important facet of government involvement in watershed policy during the 1970s. A proposed Quality Management Pipeline was protested by the State Department of Fish & Game and local environmentalists. Plans for the QMP drawn up by UWCD in the early 1970s were dropped by the end of the decade. Concern over seawater intrusion in the Oxnard Plain in 1969 led the California State Water Resources Control Board to threaten a lawsuit if local agencies could not agree on a plan for groundwater protection. By 1980, UWCD drew up plans to meet the seawater intrusion problem through the creation of the Pumping-Trough-Pipeline and the new, permanent Freeman Diversion. The Bureau of Reclamation and the State of California financed the construction of the Freeman Diversion with multi-million dollar loans. Again, the Department of Fish & Game played a significant role in demanding a fisheries study on the lower Santa Clara River (UWCD clippings files).

In 1986, Santa Clara River watershed politics again appeared on the national level with proposed designation of parts of the Sespe Creek as a wild and scenic river. The U.S. Forest Service had suggested a plan in its draft land management plan for the Los Padres National Forest. The bill to designate 31.5 miles of the Sespe as "wild and scenic" was approved by Congress and signed in 1992.

Permanent Structures on the Lower River

The construction of the Freeman Diversion was necessitated since the original earthen structure washed out almost every year. As river bed lowering occurred, especially after the 1950s and the rise of intensive sand and gravel extraction in the riverbed, the UWCD diversion had to be moved upstream about three-quarters of a mile and also was frequently damaged by storm flows. It was rebuilt, sometimes yearly, and often located further and further upstream because of riverbed degradation. Downstream erosion and increased flood water velocities caused by a sharper river gradient also affected UWCD's diversion (VCFCD, 1983).

After years of costly rebuilding, UWCD secured funding from the Bureau of Reclamation, the state of California, and local sources to help construct a permanent diversion, with groundbreaking taking place in 1988 and completion of the roller-compacted concrete dam and related structures in 1991 (UWCD clippings files).

Planning

Local and state planning efforts as well have had some impact on the river. Versions of the Ventura County general plan and city plans like that of Oxnard have projected a variety of projects along the river, from lakes to recreational trails. In its 1969 general plan, for example, Oxnard proposed the creation of a Santa Clara Bay, an inland waterway that would connect the Channel Islands Marina with the Ventura Harbor. While few of these recreational projects have come to fruition, local zoning has affected the agricultural, residential and industrial uses of the river area. For example, land reserved for agriculture under Williamson Act (Land Conservation Act) contracts has kept parts of the region surrounding the river as farming regions.

Additionally, local ordinances continued to monitor land use in the Santa Clara River Valley and the Oxnard Plain. While the creation of interurban greenbelts, for example, may not seem to directly affect the river, patterns of land use and the control of those patterns by government have historically had a very significant effect on the river.

Other structures in the watershed include Pyramid Lake and Dam and Castaic Lake and Dam, which store imported water from the State Water Project.

Bridges

The need to bridge the Santa Clara was a major concern as local population increased in the late nineteenth and twentieth centuries. Local government began intervention in the river with the planning and building of bridges. As noted before, hazardous crossings in the rainy winter season and the danger of quicksand in many regions led to a demand for the bridging of the river. Squabbling between local interests over the location of the first bridge led to delays and failed bond elections until the Board of Supervisors authorized construction of a bridge at Montalvo (near a popular early crossing) in 1897. A highway bridge was constructed. The Southern Pacific Railroad bridge at the location, built in 1898, connected Montalvo to the Oxnard sugar refinery; its wooden structure has never been damaged by flooding. Other bridges followed, some built by the state, others by the county and yet others by private users. Still, travelers have persisted in crossing the river itself in dryer regions and seasons, and river crossings like the Torrey Road crossing near Piru are still used and maintained despite frequent washouts in flood conditions. Similar crossings in Santa Paula were still used before 1920, despite dangerous quicksands, although there was also reported to be a pontoon bridge in use at that city. The vastly increased amount of highway mileage after population grew in the region in the mid-twentieth century created a demand for additional safe river crossings. A Bard Beach or Beach Road bridge existed in the 1930s, but faced frequent washouts. The present Harbor Boulevard bridge, slightly upstream of the old beach bridge, was constructed in 1955. Before construction of the Willard Bridge, many Santa Paula area residents believed that such a structure was impossible to build (California DPW 1953). The Willard bridge, first constructed in 1919 by public subscription was washed away in 1928 by the St. Francis dam failure, then rebuilt. In 1939 the bridge was

damaged again and in 1953 it was rebuilt by the state. (It is clear that there was a levee at the new bridge site in 1953, and that it was built of large boulders and filled with earth.) The Willard bridge was again damaged by flood in 1969, when two spans were lost.

As time passed, larger government entities became involved in bridging the Santa Clara River. Caltrans was involved in the construction and repair of five state highway bridges on the Santa Clara River, often in the aftermath of flooding. The Highway 101 bridge was built by the state, which constructed the first bridge in 1938 and a second in 1966 when the road was widened and northbound and southbound traffic were located on separate bridges. The Saticoy bridge (State Highway 118) existed before 1938 but was destroyed in the flood of that year and was rebuilt in 1939 by the state. In the 1969 floods, six spans of the bridge failed, and in 1978, two pilings were exposed though no spans failed due to earlier repair work (VCFCD 1983). That bridge was recently replaced by a new bridge, which opened to traffic in 1994. On Highway 23 at Bardsdale, Caltrans is construction a new bridge adjacent to a truss bridge built in 1928, which is due to be removed. On Interstate 5, two bridges were built in 1964. Notes on bridges may also be found in the Physical Setting portion of Section 3 of this report.

Other local bridges have followed the growth of subdivision and residential development. The Victoria Avenue bridge between Ventura and Oxnard was completed in 1975, accompanied by the levee work noted above. Other bridges are visible on USGS maps. See Table 3-2 on the following page.

Table 3-2
Bridges indicated on USGS quadrangle maps

Map	Date	Bridges/other crossings
Oxnard	1967	Harbor Boulevard bridge
		SPRR bridge
		Highway 101 bridges (north and south)
Saticoy	1967	Highway 118 bridge (Los Angeles Ave.)
Santa Paula	1967	Santa Paula bridge (Willard/12th St.)
Fillmore	1988	Bardsdale/Chambersburg Rd.
Piru	1988	no bridges (two crossings, including Torrey Rd.)
Val Verde	1988	bridge two miles west of county line
		crossing from 126 to Potrero Canyon
		crossing from 126 to Tapo Canyon
Newhall	1988	Bouquet Junction bridge
		bridge from 126 (Saugus-Ventura Rd.)
		I-5 bridge
		I-5 frontage road bridge
Mint Canyon	1988	Sierra Highway bridge at Solemint
		Antelope Valley Freeway bridge near Mint Canyon
		Sand Canyon Road
		crossing near Honby
		crossing near Lang
Agua Dulce	1988	bridge at Agua Dulce
		several unbridged crossings
Acton	1974	several dry crossings

Source: USGS quadrangle series indicated above

Landfills

A number of landfills exist nearby or along the river. The Chiquita Canyon landfill in Los Angeles County, in a canyon, handles waste from Valencia, Newhall and eastern Ventura County. Old dumps exist at Torrey Rd. in Piru, on Highway 23 near Fillmore (south of the river). At the Elkins Ranch, adjacent to the golf course, a dump receives some trash, including oil and chemical waste. The VRSD has a "live" dump up in the hills at Tolland Rd. below Fillmore, on the shoulder of San Cayetano Mountain. Santa Paula had a burn dump south of the river, west of 12th St. and South Mountain, in operation until the early 1970s. The river itself is the dumping site at an informal, illegal dump off of South Mountain Rd., which the county has cleared a

number of times, most recently for a cost of $300,000. A large amount of trash, including cars, boats and trailers have been found in the river's bed.

The end of Saticoy Avenue housed the old Saticoy burn dump, adjacent to the river, slightly upstream of the present Cabrillo Village levee. Further down the river are the "big three" dumps; there had been eight smaller dumps. At the Wagon Wheel area, a series of smaller dumps dating from the 1940s and forward are now closed. The Southern California Coastal landfill (from Ventura Road to the Victoria/River Ridge Golf Course) now covers the site of five older burns dumps. Across Victoria Road, an older burn dump, the Borchard dump, has been removed by the developers of the California Cove housing development. From 1982-89, the Coastal Landfill was in operation and created the hill near Victoria Ave. The Ventura Regional Sanitation District maintains the Bailard Landfill, with engineered levees built by the Ventura Regional Sanitation District and maintained by the Ventura County Flood Control District.

Between the Bailard Landfill and the Ventura Marina, "casual" dumping of trash on both sides of the river occurs. Near the river mouth, at the site of the marine, was the old Sears-Walker by the sea burn dump, where trash was often bulldozed into the ocean. Behind the levee built to protect the Olivas Park golf course, the city of Ventura dumped street or green waste, but they are working to clean up this project (Gilday 1994).

AGRICULTURE

Santa Clara River Valley agriculture has changed significantly in the years since 1920. Remnants of the cattle ranching days remain, with some cattle operations continuing near Piru and in Los Angeles County, with occasional cattle drives crossing the river. The demand for dairy products increased with the upswing in Southern California's urban population, and related development of alfalfa fields for cattle field took place early in the century. Pasture lands adjacent to the river are marked on a number of maps from the 1920s and oral histories recount grazing of cattle and horses in the river bottom.

Intensification

Yet the story of agriculture in the Santa Clara River valley and Oxnard Plain has strayed far from the days of cattle ranching. Early in the century, a variety of crops, including sugar beets, beans and truck crops, spread over the region. Today, agriculture continues to be vital, especially to the Ventura County economy, and citrus and irrigated agriculture has overtaken earlier crops that required less water. In the region of the lower river owners have shifted to smaller farms. As Ventura County and particularly coastal population increased throughout the twentieth centuries and farm areas have decreased, farmers in the Oxnard Plain have sought higher profit and increased yields. Many of these intensive crops require irrigation, often from groundwater

supplies. High revenues also served to increase land values, thus further favoring small farms. For example, by the late 1940s many farms were under 100 acres. The switch to intensive crops has been particularly linked to the growth of urban Oxnard over former agricultural areas (Gregor 1953).

The Rising Significance of Citrus

The most significant and famous shift in Santa Clara River Valley agriculture occurred as ranchers realized the higher profits of valuable citrus crops, which came to overshadow earlier types of planting. Yet other crop patterns shifted as well. Increased urban demand for dairy products in the 1920s and beyond led to an increased planting of alfalfa for cattle feed. Before the 1920s, vegetables like tomatoes, peppers, lettuce and green limas (truck crops) were insignificant, but improved transportation and population shifts led to higher production of these row crops and seeds (Gregor 1953).

Water Demands

As discussed in Section II, increased agricultural demands tapped first into the surface water supply. In 1912, surface flows supplied irrigation to almost 17,000 acres. By 1965, that number would drop to 2,500 acres, not because of reduced demand but because of reduction of surface flow (Freeman 1968). Groundwater supplies became increasingly significant. The first artesian wells on the Oxnard Plain were drilled in the 1870s. Not until after the establishment of the town of Oxnard and the building of the sugar factory in the late 1890s, however, did water demands of the Oxnard Plain reached levels high enough that water pressure in the Oxnard Basin was reduced and pumps had to be installed. Water companies established at the start of the twentieth century continued to deliver groundwater deliveries. They were joined by new corporations like the Citrus Mutual Water Company (1929), serving 305 acres of irrigated agricultural land, and the Hardscrabble Mutual Water Company (1920). Individual farmers and ranchers also dug their own wells. Various water companies, local governments, and ranches had steam or electric pumping plants to deliver water for irrigation and other uses. It was this increased dependence on not only surface flows of the Santa Clara River but the rich but potentially threatened groundwater supplies in the Santa Clara River watershed that led individual ranchers to join together in the 1920s, when they saw the water supply threatened by users outside the watershed and increased use within the watershed.

Drainage

As discussed in Section II, before 1920 lowlands in the Oxnard Plain had a high water table, and alkali accumulation prevented successful production of certain crops. However, significant tiling provided these areas with improved drainage. Starting at the turn of the century, fields used for sugar beets were "tiled" and local drainage districts were formed to assist with the process. Tiling now underlies a vast portion of the Oxnard Plain and part of the river valley. Many ditches

drain, eventually, to the Pacific Ocean or McGrath Lake, but a number of agricultural drains from this tiling contribute their runoff to the Santa Clara River itself. The character of such run-off water differs from the river's water.

With the growing desire for tree crops, farmers became interested in increasing their irrigated acreage. Lemons, in particular, are sensitive to a high water table and alkaline conditions, but have been planted in reclaimed areas (Gregor 1953). From 29,000 acres in 1917, orchard land in Ventura County increased to 66,000 acres in 1950. Overall, irrigated acreage in Ventura County increased from 31,700 acres in 1919 to 107,689 in 1949, and by the late 1940s, only 4,900 of the original 74,800 dry-farmed acres in the Oxnard area continued to be farmed without irrigation (Cuevas 1973).

Crop Variety: The 1920s

A detailed map of the Santa Clara River from the Southern Pacific Railroad Bridge below Highway 101, dated from the late 1920s, indicates the variety of crops in the lower river reaches. Even very close to the high water line at the beach (in the area that is now McGrath State Beach) alfalfa was planted. Pasture land lined many sections of the river and extended to the brush or sandy river bottom (LADPW 1929). Recollections by area farmers include mention of cattle and horse grazing in this region of the river bottom throughout the twentieth century. Throughout the 1920s, hay and alfalfa were grown near the river, with beans and barley grown on the river banks. Brushy areas were scattered throughout cultivated lands. A lemon grove was located on the north bank above the railroad and highway bridges, while potato and alfalfa fields were located above the river bank to the south (LADPW 1929).

Detailed topographic maps of sections of Rancho San Francisco from 1922 indicate that citrus crops were protected by other less valuable crops. This land owned by Newhall Land and Farming (NLF) featured oranges, lemons, alfalfa and peaches. In addition, a pump house existed in the river bed. Other NLF property, such at that at the county line, were marked "tillable" but were at that time unplanted. On the rest of the maps, which indicate the Del Valle Ranch (Camulos), walnuts and olives were planted closest to the river, along with a protective grove of gum trees, and alfalfa fields and apricot orchards also provided a buffer between citrus groves and river land. Some unplanted lands were clearly marked "overflow bottom land," indicating consistent flooding.

Crop Variety: The 1930s

In 1933, when the Division of Water Resources issued the Ventura County Investigation, the principal crops of the coastal plain were beans, beets, alfalfa and truck. Bulletin 46 projected that 5400 acres of additional land in the Oxnard Plain would come under irrigation in future years. The report notes that citrus trees used more water than beans, beets and truck, and that water use would probably increase with increased plantings of citrus. Within the Santa Clara River Valley,

DWR estimated 23,500 acres irrigated or using domestic water in 1933, while 10,000 to 13,000 additional acres were feasible for irrigation. However, the best irrigable land had already been used, and DWR predicted that progress in irrigating other lands "should be slow and should depend to a large extent on what lies in the future for citriculture" (DWR 1933). Aerial photographs reveal progressively more significant plantings of citrus along the river valley.

The crop map accompanying Bulletin 46 demonstrate a variety of land uses along the river. To Saticoy, most of land surrounding the river bottom was unirrigated, with sections of alfalfa near the south side of the river outlet, and with walnuts and beans, beets and hay up the river to Saticoy. Near Saticoy Road were the first citrus groves adjacent to the river, along with truck gardens and continued plantings of walnuts and beans, beets and hay. Between Saticoy and Santa Paula on the south side of the river were several citrus or avocado orchards at the base of South Mountain, with walnuts, alfalfa and truck gardens on the north side. Some citrus was planted to the south of Telegraph Rd., but the closer to the river, the more likely plantings were in walnuts, truck crops or alfalfa, with unirrigated valley lands interspersed throughout the area. The same pattern continued from Santa Paula to Fillmore, with major citrus plantings on the south side of the river at Bardsdale, large stretches of unirrigated valley land, and scattered plantings of truck, alfalfa and walnuts. Upstream from Fillmore lay unirrigated lands and citrus plantings on the north bank, scattered with alfalfa. On the south bank citrus predominated with plantings close to the river banks. At Buckhorn and Camulos, citrus and avocado dominated, with the lands next to the river varying between citrus plantings, alfalfa and unirrigated land. On the south river bank near Tapo Canyon lay additional citrus/avocado plantings, with unirrigated valley farm lands indicated to the county line and beans, sugar beets and hay plantings around Telegraph Rd. (Highway 126) at the north side of the river at the county line. Within Los Angeles County, unirrigated farm lands predominated through Castaic Junction and further upstream, with additional riverside plantings of alfalfa and beans/beets/hay near Saugus and Honby. With the exception of occasional orchards and alfalfa patches, unirrigated agricultural land predominated upstream to the end of the map at the community of Lang (DWR 1933).

Continued Agricultural Shifts

The crops of major landholders like Newhall Land and Farming shifted in type and quality after 1920, as well. Tenant farmers worked much of the Newhall property until the 1920s and 30s when the company retook control and planted more profitable citrus crops. After 1945, the ranch cut back its sheep and hog production, in part because of the increased value of irrigated crops. While in 1913, the Newhall Ranch had 150 acres of oranges planted, by the 1930s citrus filled nearly 600 acres. Between 1948 and 1955, walnut acreage on land not suitable for citrus due to a colder climate (Rolle 1991).

DWR Bulletin 46-A, which provided statistical information to support the Ventura County Investigation, noted the acreage of different crops in the various regions of Ventura County in 1932. In the Piru Basin, of 3658 acres planted, over 2600 acres were in citrus. A similar pattern

existed in the Fillmore Basin, where over two-thirds of cultivated land, 6100 of 8863 acres, was planted to citrus. In Santa Paula, out of 10,756 acres, citrus also predominated (4700 acres) but walnuts ranked a close second (4000 acres). Oxnard South Basin, the largest agricultural region, had 25,750 acres planted with only 1500 in citrus, and over 16,000 acres of beans and beets, with alfalfa and truck crops using an additional 5000 acres (DWR 1933).

Changes in local agriculture have included a shift toward smaller farms, especially on the lower river. As population increased in the late twentieth century and farm area has decreased in certain regions, farmers have looked toward higher-priced crops. Many of these intensive crops need irrigation, often using ground water supplies. High revenues also served to increase land values, further favoring small farms. By 1949, over 62% of the grain, row, or tree crop farms in the Ventura Lowland region were under 100 acres. The switch to intensive crops has been particularly linked to the growth of urban Oxnard (Gregor 1953).

Subsequent DWR investigations have highlighted the continued shifts in agriculture. The Oxnard Plain has lost some fields used for truck crops to both urban uses and field crops. In general, farming has become more intensive, with alternation between field and truck crops in different seasons. While truck crop acreage declined 12% from 1969 to 1980, field crop acreage increased 30%. In the Santa Clara River Valley itself, acres devoted to truck, field and alfalfa declined from 1969 to 1980, but citrus, deciduous, grain, and pasture lands increased (DWR 1981). See Tables 3-3 and 3-4 below.

Table 3-3
1980 Agricultural Land Use

	Oxnard Plain Subunit	Santa Paula Subunit	Sespe Subunit	Piru Subunit	Upper Santa Clara River Subunit
Irrigated:					
Alfalfa	0	10	0	120	180
Pasture	80	50	260	370	380
Citrus/ subtropical	11,230	10,340	11,740	5,370	20
Truck	28,790	820	380	40	1,680
Field	2,180	20	0	0	430
Deciduous fruits/nuts	20	60	20	30	690
Small grains	0	350	0	0	690
Fallow	180	60	0	30	80
Nonirrigated agriculture	2,760	330	250	1,510	110

Source: DWR 1981

Table 3-4
Shift Between 1969 and 1980 Agricultural Land Uses,
Ventura County and Los Angeles County Study Area

Irrigated Agriculture

Ventura County	1969	1980	% change
Alfalfa	420	470	+ 12
Pasture	1,770	2,210	+ 25
Citrus/Subtropical	54,170	62,850	+ 16
Truck crops	39,570	34,500	- 13
Field crops	2,030	2,640	+ 30
Deciduous fruit and nuts	2,650	1,890	- 29
Small grains	530	1,870	+253
Total	101,140	106,480	+ 5

Los Angeles County (study area)	1969	1980	% change
Alfalfa	860	180	- 79
Pasture	460	460	0
Truck crops	1,470	1,680	+ 14
Field crops	180	440	+144
Deciduous fruits and nuts	460	470	+ 2
Others	150	0	n/a
Total	3,580	3,230	- 10

Source: DWR 1981

Agricultural Alterations of the River

Just as agricultural interventions in the riverbed were noted in the commercial period (1870-1920), so they continued into the modern era. A survey of aerial photographs and USGS topographical maps indicates the presence of large numbers of levees and other structures built to prevent and repair flood damage. For example, maps from the 1920s indicate the presence of a row of pilings or "breakwater" below the Montalvo bridge. This structure, sometimes known as the McGrath piling, ran down the middle of the riverbed, and is also visible in aerial photographs. Along the banks in the same area are a series of small jetties or groins for flood control. Some of these structures existed before the St. Francis Dam failure, which others were created after that event. Nearly every map or set of photographs of the river in the modern era shows evidence of some form of bank control. For example, photos with the Army Corps of Engineers flood plain

reports show distinct manmade rock and brush buildups along the bank at river mile 35.0 and 35.5 (near the Ventura/Los Angeles County line).

In general, the aftermath of floods has created a desire on the part of farmers to repattern the river into familiar configurations, controlling storm flows and preventing bank erosion. Thus, where Hopper Creek enters the river below Piru, a new jetty was built in the aftermath of the 1969 flood (Taylor 1994). Other structures work together with public works projects to create more unified flood control measures. The "farmers' levee" built at Coultas Ranch along the lower river in the mid 1980s is one example of such a structure. While it was built with permits from the county, its history followed the pattern of numerous other structures, many of which were clearly not controlled by any regulatory agencies. The levee is constructed of riverbed material, extracted from an "island" in the middle of the river above the Harbor Boulevard Bridge. It essentially continues the levee separating the Bailard landfill from the river itself.

Other levees and similar structures, intended for agricultural and urban protection, can be identified at various sites from aerial photographs and maps.

Surface Flows

The use of Santa Clara River water for irrigation, which began in earnest in the second half of the nineteenth century, continued throughout the twentieth. Diversions and other structures (pipelines and ditches) permitted the development of irrigated agriculture in the river valley and the Oxnard Plain.

Early in the 1900s, over 16,000 acres were irrigated by the surface flows of the Santa Clara. But agricultural and other uses and the building of dams changed these early patterns. By the 1960s, surface flow had diminished and use of groundwater replaced earlier sources. By 1969, only 2,500 acres were irrigated by surface flows (Freeman 1968).

Agriculture and the River

While most agriculture has taken place outside the river's "banks" much agricultural land has been vulnerable to flooding and agriculture continues to encroach upon lands adjacent to the river. Some water-intensive crops have been planted close to the river. Some agriculture, like watercress farming and gathering, is done within the riverbed itself (in some cases, in former recreational duck ponds). The harvesting of *Arundo donax* or giant reed within the river is another use of the river bottom land, although not a result of agriculture per se. Although this plant is an exotic, and many desire its eradication, it does have limited commercial use. A private firm harvests the wild plant from farmers' river bottom land for use in the manufacturing of reeds for woodwind instruments. Indeed, the Santa Clara River is reputed to contain the finest reed source in the United States (Gilday 1994).

Using any sort of borders for the river, such as flood plains, as landmarks has limits in this sort of historical study, since those lines have changed with time. Indeed, aerial photographs and historic maps make clear that what surveyors have called the "banks" of the river have shifted even over short periods of time. Aerial photographs, particularly from 40-60 years ago, clearly show scarring from former river flows as well as revealing the past braiding so characteristic of rivers like the Santa Clara.

URBAN IMPACTS

Since 1920, urbanization has continued to affect the Santa Clara River and adjacent floodplains. Since the 1950s, especially in the Upper Santa Clara River region, development has had a significant impact. Urban and industrial uses of the river and surrounding areas are many and varied. Some of these uses--such as bridges, flood control and landfills--are discussed in the "Government" section of this report. Others are private efforts closely linked to the residential and industrial boom in Los Angeles and Ventura Counties since the 1920s, in what this report terms the "industrial era." The major industrial use of the river itself has been sand and gravel mining, an industry that is closely related to the increasing urban development, including building and road construction, in the Santa Clara River valley.

Resource Extraction

Sand and gravel mining is the best known form of resource extraction in the history of the Santa Clara River. Indeed, the river produces the best aggregate material in the county, and much of the county's roads and other structures were built out of materials extracted from the river. With the growth of the county in the early 1900s and the construction of paved roads, local farmers and landowners were asked by construction companies for permission to extract aggregate from the river. Some of these farmers entered the mining business themselves; the Swift, Donlon, Borchard business, which maintained a small rock plant, near the Montalvo bridge, is one example. A number of farmers have attempted to lease out river land for mining but have found their aggregate resources were inappropriate; Newhall Land and Farming, for example, has tried to lease out riverbed land but without success (Elliot 1994). Maps from the late 1920s clearly show the location of at least one rock plant at Montalvo, surrounding by agricultural lands. City directories from the late 1920s for the first time list the existence of several sand and rock producers and distributors.

Larger companies generally bought out the local businesses. In 1939, L.R. Howard leased the property of the Swift, Donlon, Borchard extraction business and took over the rock operation, operating it until the early 1950s, when Southern Pacific Milling bought out the operation. Southern Pacific Milling, which since 1885 had based its business on warehouses and lumber along the route of the Southern Pacific Railroad, changed its emphasis to mining, concrete and

asphalt production when it was bought in 1947 by H.K. Porter Company. Also near Montalvo, El Rio Construction and the Woolsey/Hertel partnership participated in sand and gravel extraction, although their extractions from the river were less significant (Elliot 1994). Near the Saticoy bridge, Saticoy Rock Company did a great deal of mining during World War II. Their operation was acquired by Conrock (Calmat), which did most of the deep channel digging below and above the bridge until 1986. Upstream at Peck Road near Santa Paula, Mission Rock operated aggregate extraction until in 1955, Livingston-Graham took over operations. This mining dug extensively and deeply into the river bed (Elliot 1994).

Gravel and sand extraction also occurred in other areas above Saticoy. At Santa Paula, as in lower reaches of the river, mining has occurred since the 1920s. O.P. Barker bought Santa Paula Rock in 1945 and Southern Pacific Milling in turn purchased the operation in the early 1950s. Below 12th Street, the company operating milling had been Santa Clara Rock. Above 12th St., Owl Rock began digging in the 1960s, and aggregate production has continued on and off since then, with Granite being the latest company to dig. Other operations have taken place in Los Angeles County, although the quality of aggregate is much lower. Calmat, in the late 1980s, mined sand in the upper river area (Elliot 1994).

Some smaller mining operations have been carried out on Sespe Creek and Santa Paula Creek. In addition, unpermitted "outlaw" operations have taken place over the years. Other county government agencies have obtained permission for other uses below the red line. Ventura County Flood Control District is one of the agencies that issue permits for aggregate removal. For example, 350,000 cubic feet of fill was taken from the river bed near Coultas Ranch as landcover on the Bailard landfill. This digging eliminated a brushy island from the lower river and altered the river channel (Coultas 1994).

Aerial photographs of the river in the 1960s demonstrate the extent of mining in the Santa Clara River. Evidence of roads crossing the river bottom is pervasive in photographs and maps. Trucks are often present in the river bottom, and extraction operations are clearly visible. Deep basins and scarring of the river channel itself are present in aggregate extraction areas (Mark Hurd series, 1960-62).

As discussed in the government section above, permitting processes changed the nature of gravel extraction from the river. The first county permit for gravel mining was issued in the early 1970s. Gravel mining in the Santa Clara River changed forever with the studies and conditional use permit documentation of the 1970s and 1980s. A "red line" was created to limit mining in the river. At first, an imaginary line from the top of footings at the Santa Paula Bridge to the top of footings at the Montalvo Bridge limited the depth of mining; this line has subsequently been revised to reflect more sophisticated projections (Collart 1994).

In 1975, California passed the Surface Mining and Reclamation Act, intended to protect access to significant mineral resources and require reclamation of lands used in aggregate extraction. CUP restrictions also required aggregate companies to create reclamation plans after the early 1970s.

State law requires that extractions over 1000 cubic yards required reclamation, such as grading and replanting. In 1980, Ventura County began its Mineral Resource Management Program, with the State Division of Mines and Geology conducting a resources survey (Ventura County Resource Management Agency 1993, Collart 1994).

While other activities, like dams and levees, can contribute to channel degradation, but there is "no evidence to indicate that these potential effects actually occurred." Most reports about aggregate extraction along the river agree that "the loss of riverbed material and accompanying channel degradation is primarily, if not totally, the result of gravel mining from the channel" (Ventura County Environmental Resource Agency 1979). Erosion caused by deep gravel and sand mining in the river was blamed for many problems. Erosion of the pilings of the Saticoy Bridge led to that bridge's washout in the massive floods of 1969. Until the construction of the concrete, engineered Vern Freeman Diversion in 1988, the dirt Saticoy Diversion maintained by United Water Conservation District was destroyed and rebuilt repeatedly, generally being moved farther and farther upstream from the toe of South Mountain to maintain sufficient gravity flow. Material for the rebuilding of that diversion usually came from the river bed itself. As the river bed degraded, the diversion was moved upstream to ensure sufficient gravity flow to the spreading grounds.

Urban Developments

A major part of the development along the Santa Clara River has come in Los Angeles County. One significant step in the urbanization of the upper Santa Clara River area came in 1964 when the state purchased a large strip of land from Newhall Land and Farming for construction of Interstate 5. The once remote lands of Rancho San Francisco became linked to urban Los Angeles, and Newhall Land and Farming began work to develop their property holdings. Plans began in the 1950s when the company hired architects to plan home locations and in 1964 Newhall Land and Farming announced plans to create a new community, called Valencia. The company further boosted development with the donation of land for an arts center, the creation of several golf courses, and the development of Magic Mountain, which was operated by Newhall Land and Farming from 1972 to 1979 before being sold to another company (Newhall 1992).

The DWR in 1980 estimated that urban water uses in the Upper Santa Clara River Drainage Area and in Ventura County were greater than agricultural uses by a narrow margin of 51 to 49 percent. By comparison, urban uses demanded only 39 of local water service in 1969. The number of urbanized acres in the DWR study area increased by over two-thirds, from 72,600 acres in 1969 to 121,870 acres in 1980. The greatest gain was in industrial use (136% increase), with significant gains in residential (68%) and commercial (64%) acreage as well. Population of these areas also increased significantly, although not at as great a rate as predicted by early planning studies in the 1960s. In the Los Angeles County portion of the study, residential land uses took a large jump (156% increase) from 1969 to 1980. Changes in agricultural land uses are discussed above, but it is worth noting that the LA County section of the study showed a 27%

decrease in irrigated acreage between 1969 and 1980, from 5,330 acres to 3,900 acres (DWR 1981).

Table 3-5
Population Statistics 1930-1980

Year	Ventura County (total)	Upper Santa Clara River Drainage Area (Los Angeles County)
1930	54,976	3,287
1940	69,685	5,620
1950	114,647	10,269
1960	199,138	18,362
1970	378,497	52,700
1980	532,700	93,600

City Population Statistics

City	1940	1950	1960	1970	1980
Oxnard	8,519	21,567	40,265	71,225	115,797
Ventura	13,264	16,534	29,114	55,797	83,084
Santa Paula	8,986	11,049	13,279	18,001	20,522
Fillmore	3,252	3,884	4,808	6,285	9,538

Source: DWR 1981

As urban areas have grown, communities have built sewage treatment plants along the river in Los Angeles and Ventura counties, thus adding structures that demand flood protection and that can contribute effluent water to the river.

Recreation

Recreational uses along the river have varied widely. Fishing was an intermittent pasttime possible along the Santa Clara at least in the early part of the twentieth century and before. The continued presence of steelhead in the river and in the Sespe Creek has been a source of environmental controversy in the past two decades. Areas along the river have also been maintained as duck ponds, and a number of duck clubs were located near the mouth of the river in the first half of the twentieth century. Private families also maintained duck blinds as well. Some extensive maps of these areas exist in the plans for a beach road bridge at the mouth of the river, drawn up in 1935 and 1936 (County Surveyor's Office).

Some of the earliest "grand plans" for the watershed involved recreational use, although none of these plans were carried out. An "electric road" to accompany a massive hydropower project on

the Sespe was proposed in the early 1900s. A monorail to the Sespe Hot Springs was suggested in the 1920s but despite a grand groundbreaking ceremony the project was never built (Freeman 1968).

A number of golf courses, public and private, are adjacent to the river. Some of these, apparently, are irrigated by river water, using existing claims on water rights from the Santa Clara (Taylor 1994). Recreational vehicle parks also are scattered along the Santa Clara upstream from Piru and into Los Angeles County.

At the same time, increased recreational demands directly affected the river. All-terrain vehicles and other motor vehicles have been frequent and illegal intruders on the river bottom and surrounding lands. More formal recreational facilities on private lands followed a similar path. A motor sports park known as Indian Dunes was run by Newhall Land and Farming. At Indian Dunes, which apparently operated in the 1960s and through the early 1970s, motocross racing in the river bottom was a popular sport. Some of this land, apparently, was used for motion picture filming in subsequent years. Other entrepreneurs have run recreational activity centers such as trail rides through the Upper Santa Clara River bed. The reservoirs at Piru, Pyramid, Bouquet Canyon, and Castaic dams provide recreational activities ranging from fishing and boating to camping and swimming.

Municipalities have included river plans in their general recreational plans since the 1960s, but few of the extensive plans have come to fruition. The City of Oxnard, for example, drew up plans for an inland waterway in one of its general plans. Along the upper river area, some communities have used the river as a center for recreational areas.

Other Human Uses

There are other human uses of the river on a much smaller scale. The riverbed has provided a de facto housing community for many years. Stories of the St. Francis Dam failure describe how hobos who lived under local bridges were warned of the coming flood. Hobo encampments persisted throughout the middle of the century and the homeless continue to reside in the river bottom of the Santa Clara. Probably more than one semi-permanent housing structure (trailer, e.g.) is or has been illegally located in the riverbed area.

Section 4

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