

# The Development and Decline of Agriculture in the Owens Valley

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*Abstract.* Whenever urban water agencies in the West want to obtain additional water supplies by acquiring agricultural land and water rights, the decline in Owens Valley irrigated agriculture is always brought up as a reminder of the changes that can take place when water is exported from rural areas. Unfortunately, descriptions of what happened in the Owens Valley commonly distort the original agricultural landscape and the subsequent changes that took place as a result of the export of water by the City of Los Angeles. This paper will chronicle the irrigation history and agricultural land use in the Owens Valley in the late 19th and early 20th centuries prior to the development of the Los Angeles Aqueduct system and then examine the changes that took place as the aqueduct system was developed and demand for water by Los Angeles increased. By the beginning of the 20th century, Owens Valley had developed into a small but established agricultural area (40,000 irrigated acres and over 4,000 persons employed in the agriculture sector), although farming was a challenge because of the vagaries of climate and water supply and limitations imposed by soil conditions and distance from markets. Wheat, corn, barley, fruits, and vegetables were grown, but most of the irrigated acreage in the Owens Valley was devoted to forage for grazing cattle and sheep. By 1935 Los Angeles had purchased nearly all of the irrigated land in the Valley and leased back the land for grazing and growing forage, effectively eliminating the growing of any nonforage crops. Under Los Angeles ownership, the acreage of irrigated land in the Valley varied with runoff conditions and demand for water in Los Angeles. Current agreements with Inyo County stabilize the irrigated acreage in the Owens Valley.

## INTRODUCTION

The agricultural development of the Owens Valley occupies an emotional niche in the history of California because it conflicted with the development of a water supply for the City of Los Angeles. Most accounts of the Owens Valley history, ranging from professional journals to television, describe the transformation of a remote agricultural hinterland to a major water source for the largest city on

the West Coast in terms that frequently reveal the authors' biases. These descriptions vary from the "Rape of the Valley" to the willing acquiescence of land and water rights for the greater public good.<sup>1</sup> The pervasive biases exhibited by authors may result from their varying perceptions of (1) the social implications of the dramatic land-use changes in the Owens Valley and Los Angeles during the last 60 years, (2) the interplay of urban/rural cultures and of the individual personalities, and (3) the sublime physical setting in which the story takes place. Unfortunately, the descriptions of the Owens Valley transformation commonly distort the original cultural landscape and the subsequent changes that took place. The intent of this paper is to chronicle agricultural land use in the Owens Valley and the changes that have occurred since the first livestock were driven into the Valley 120 years ago.

### Early Observations

Located at the base of the eastern escarpment of the Sierra Nevada (Figure 1), the Owens Valley seemed to some of the early explorers like an improbable place for agricultural development. A. W. von Schmidt observed in 1855 that, "On a general average the country forming Owens Valley is worthless to the white man, both in soil and climate."<sup>2</sup> Perhaps von Schmidt was struck by the exceedingly hot summers and low winter rainfall, or the stony fan soils and the alkali-laden bottomland, or the sheer desolation of a high-desert valley on the eastern border of California.

Other early observers had different perceptions of the land potential of the Owens Valley; a newspaper account from the 1860's stated that:

"In two years Owens Valley will be the most densely populated of any east of the Sierras (*sic*) in California. On the west side of the valley is a belt of agricultural land not surpassed by any land in the State" [Chalfant, 1933, p. 202].

Perhaps they were impressed with the great quantities of spring and summer runoff from the Sierra Nevada or with the vast expanses of grass meadows in the northern half of the Valley. Captain J. W. Davidson commented on the meadows in 1859 when . . .

". . . I marched as far as the Canon of Owens River through some of the finest country I have ever seen. It may be said literally to be a vast meadow, watered every few miles with clear, cold mountain streams, and the grass (although in August) as green as in the first of Spring" [Wilke and Lawton, 1976, p. 20].

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<sup>1</sup>"The Rape of the Valley" is the title of a chapter in Morrow Mayo's *Los Angeles*, Alfred Knopf, New York, 1933. Mayo's book was a vitriolic condemnation of Los Angeles' actions in the Owens Valley, and its popularity spawned the extensive use of the phrase, "The Rape of the Valley." "The Rape of the Valley" is rebutted in a guest editorial in the *Los Angeles Times* [1976], entitled "The Rape that's Not."

<sup>2</sup>von Schmidt surveyed the Eastern Sierra in 1855. His survey field notes can be found in the Sacramento Office of the United States Bureau of Land Management.

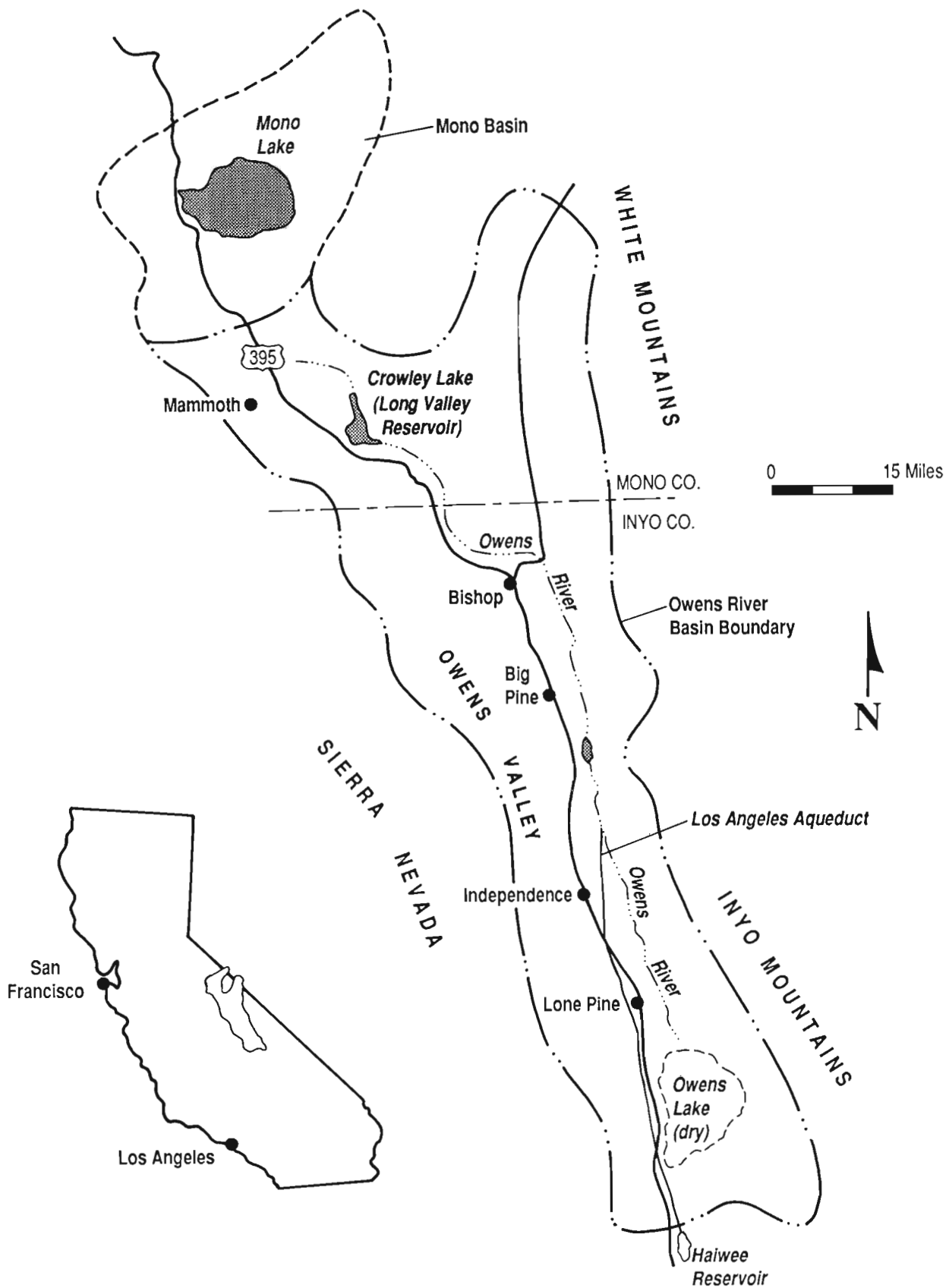


Figure 1. Location and major features of Owens Valley, California.

These meadows depended on a combination of abundant surface runoff and near-surface (0 to 8 ft [0 to 2.4 m] below ground level) water table that occurred naturally beneath approximately 80,000 acres of the Valley [Earth Satellite Corporation, 1974].

### **Agricultural Development from 1861 to 1900**

The Owens Valley meadows first attracted livestock in 1861, when cattle were driven up *via* the south end of the valley from Kern County. In 1864, the second year of a severe drought in the state, William Brewer observed, “Tens of thousands of the starving cattle of the state have been driven in here this year, and there is feed for twice as many more [Brewer, 1966].” Brewer also noted that good quality vegetables were grown and sold in the Owens Valley. During the 1870s 200,000 head of cattle were said to have wintered in the Owens Valley [Erlich and McGaughy, 1964].<sup>3</sup>

The first wheat crop was cultivated in the Owens Valley in 1865. By 1867, 2,000 acres of land were fenced in, over one-half of it cultivated [Watson and Storie, 1928, p. 66]. The 1870 United States census of agriculture reported over 5,000 acres of land were “improved” and almost 5,500 head of cattle were pastured in the Valley (Table 1).<sup>4</sup>

The irrigation methods employed by the first settlers were quite crude, as they merely diverted the flow of the creeks onto adjacent lands. Irrigation of creek-side lands was also attributed to the native Paiute Indians who diverted the flow of creeks onto adjacent lands to enhance the growth of “Taboose” (Yellow not-grass; *Cyperus esculentus*) and “Nahavita” (wild hyacinth; *Dichelostemma pulchellum*) (M. DeDecker, pers. comm., 1992).

Early agricultural development in the Owens Valley was stimulated by the market for agricultural products in the numerous mining camps around the area. The camps at Aurora, Bodie, and Cerro Gordo had, during times of peak production, more inhabitants than the sleepy pueblo

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<sup>3</sup>The figure 200,000 head of stock is attributed to old timers.

<sup>4</sup>United States Bureau of Census, Census of Agriculture, Census of 1870 Census figures are for Inyo County, but since practically all agriculture in Inyo County was in the Owens Valley, these figures are applied to the Owens Valley. The United States Census of Agriculture was conducted every five years. Counties are usually surveyed the year preceding the issuance of the census. The year of the survey is important in the Owens Valley because the acreage of intermittently irrigated pasture is dependent on annual varying spring and summer runoff from the Sierra Nevada. The United States Census of Agriculture was the most complete breakdown of agricultural production for all of Owens Valley in the period 1870 to 1925 available at the time of this report. Inyo County intermittently recorded annual agricultural production up to about 1924. These figures, from the Inyo County Horticultural Commissioner, are apparently available from the Inyo County Archives in Independence, California. Breakdowns of agricultural production for selected areas of Owens Valley (*e.g.*, Big Pine, Bishop) in the 1909 to 1924 period are also reported in Los Angeles Department of Water and Power (LADWP) internal publications.

TABLE 1

Year	Runoff	Source	Fruit	Vegetable	Total Grain	Corn	Hay/ Alfalfa	Total Cultivated	Irrigated Pasture	Cattle Numbers	Total Irrigated Land
1870	Dry	Census				780	1,456	2,200	2,800	5,480	5,000
1880	Wet	Census			3,200	1,682	5,346	10,500	14,400	7,270	28,300
1890	Wet	Census		100	3,118	1,093	9,550	13,900		13,321	
1900	Normal	Census	33,000 Trees 41,000 Vines	107	3,421	2,106	14,723	19,800	24,000	12,594	41,062
1903	Normal	RS									35,000
1909	Wet	Lee						18,500	32,500		51,000
1910	Wet	Census	20,000 Apple 40,000 Vines	326	2,975	18,83	16,209	21,000	44,000	20,308	65,163
1920	Normal	Census	1,528	182	2,700	1,632	16,681	23,000	53,500	25,556	75,000
1922	Wet	Lee						35,000	25,000		60,000
1925	Dry	Census	1,401	252	1,400	1,632	14,032	21,000		20,651	
1930	Dry	Census	588	25	960	1,534	8,902	12,000	15,500	12,519	27,500
1940	Normal	Census	113	6	93	912	4,017	5,100	18,500	157,10	23,625
1947	Dry	DPW									75,000
1950	Normal	Census		100	50	149	3,011	3,200	12,100	13,543	13,361
1950	Normal	DWR	200	200	100		4,800	5,300	4,600		9,900
1954	Dry	LADWP						4,000	17,900		21,900
1955	Dry	LADWP						0	0		0
1956	Wet	LADWP						3,000	58,500		61,500
1957	Normal	LADWP						2,900	19,300		22,200
1958	Wet	LADWP						2,900	59,300		62,200
1959	Dry	LADWP						2,700	19,300		22,000
1959	Dry	Census			24	67	3,931	4,000	25,500		29,500
1967	Wet	SCS		200			2,714	2,900	9,400		12,300
1972	Dry	DWR					2,600	2,600	12,100		14,700
1978	Wet	DWR					3,800	3,800	11,700		15,600
1978	Wet	LADWP					3,000	3,000	8,000		11,000
1981	Normal	Inyo						4,100	11,800		15,900

Table 1. Agricultural land use in the Owens Valley. All figures are in acres unless otherwise noted. Blanks indicate no figures were reported. Runoff is classified **dry** if annual runoff is less than 80 percent, **wet** if runoff is above 120 percent, and **normal** if runoff is between 80 and 120 percent.

Sources: **Census**—United States Bureau of Census, Census of Agriculture; **DPW**—California Department of Public Works [1947]; **RS**—United States Reclamation Service, [1904]; **DWR**—California Department of Water Resources [1960] and [1979]; **Lee**—Lee [1909] and [1922]; **SCS**—United States Department of Agriculture, Soil Conservation Service [1967]; **LADWP**—Los Angeles Department of Water and Power; **Inyo**—Inyo County Water Department [1981].

of Los Angeles (*i.e.*, more than 10,000 miners, although the peak population never lasted more than a few years<sup>5</sup>). Livestock grazing was the dominant agricultural activity, and the majority of the cultivated and irrigated land was devoted to forage crops and pasture. Nonforage crops, however, including corn, wheat, barley, oats, potatoes, and various vegetables were increasingly cultivated. The 1880 census of agriculture reported nearly 5,000 acres of “improved” land [United States Bureau of Census, Census of Agriculture, 1880]. Much of the “improved” land included the natural meadows west of Bishop used as pasture and in the Valley along the Owens River. These lands were intermittently irrigated to enhance the growth of native grasses. The nonforage crops were more suitably grown on the soils found on the lower part of the large alluvial fans, above the water-logged and alkaline land of the valley bottom and below the rocky soils found higher up on the fans.

To increase the amount of irrigable land, the Owens Valley farmers organized eleven mutual water companies and built a network of canals and ditches mainly in the northern end of the Valley from 1878 to 1905. The unlined canals carried water from the Owens River, the trunk stream draining the valley, and other major lateral tributaries such as Bishop and Big Pine Creeks, to lands located away from the stream courses. Mary Austin observed in 1903 that, “It is the proper destiny of every considerable stream . . . to become an irrigating ditch” [Austin, 1950, p. 81]. The over 100 miles of canals in the Bishop and Big Pine area could potentially irrigate approximately 70,000 acres of land.<sup>6</sup>

The canals, along with the on-farm delivery ditches and furrows, were extremely wasteful of water. Uncontrolled spillage of water in peak runoff periods and considerable seepage through the unlined ditches contributed to the formation of tule marshes. Excessive irrigation of high water-table land also formed new areas of swamp.

The boom/bust mining towns did not always provide a stable outlet for Owens Valley agricultural goods, the result being that the supply of agricultural goods sometimes exceeded the demand in the 1880s and 1890s. The acreage of cultivated nonforage crops, for example, was less in 1890 than in 1880 [United States Bureau of Census, Census of Agriculture, 1890].<sup>7</sup>

### **Agriculture at the Turn of the Century**

The increased mining activity in western Nevada at the turn of the century, especially at Tonopah and Goldfield, provided an expanded market for Owens Valley agricultural products. The narrow-gauge

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<sup>5</sup>United States Census figures for Inyo County do not reflect the transitory booms in population at the mining camps.

<sup>6</sup>Calculated from map compiled by Lee [1922].

<sup>7</sup>Markets for hay and grain suffered as a result of the new Carson-Colorado railroad putting many grain and hay-eating horse teams out of business. The railroad, unfortunately for the farmers, didn't eat grain.

Carson-Colorado Railroad, constructed in 1883 to connect the Owens Valley with the transcontinental railroad near Reno, facilitated the transport of agricultural products to the Nevada markets.

Commercial fruit production began in the Owens Valley in the late 19th century. The 1900 census of agriculture reported over 33,000 fruit-bearing trees and over 41,000 grape vines [United States Bureau of Census, Census of Agriculture, 1900]. Apples and pears were the principal fruit crops. The fruit growing areas were generally restricted to scattered localities high on the alluvial fans where danger from late spring killing frost was minimized. The soils in these localities were generally gravelly and highly porous, some required up to 15 ft (4.6 m) of water per acre [United States Reclamation Service, 1904].

Other fruit and vegetables grown for sale included potatoes, tomatoes, cabbage, melons, onions, strawberries and cantaloupes. Potatoes were the largest of these crops, although pests (worms) later curtailed potato production. Produce from the Owens Valley won prizes at the California State Fairs for its outstanding quality, but the potential of late spring frosts following warm, early springs was a deterrent to increased fruit and vegetable production. The distance of the Owens Valley from large markets was another obvious deterrent.

The acreage of nonforage crops increased to approximately 5,500 acres in 1900 [United States Bureau of Census, Census of Agriculture, 1900]. Wheat and corn accounted for nearly 80 percent of this acreage. The majority of cultivated land in the Owens Valley in 1900, however, continued to be forage crops, principally alfalfa. The cultivated land totalled about 15,000 acres. An even greater amount of acreage, about 21,000 acres, was intermittently irrigated for forage and pasture. The Owens Valley was particularly well suited to the sheep and livestock industry, because, in addition to the feed available from irrigated land in the valley, pasturage was available in the summer months in the higher elevations of Inyo and Mono counties.

The amount of irrigated acreage in the Owens Valley was dependent on the amount of spring and summer runoff from the mountains. Two-thirds of the average annual runoff occurred in May, June, and July. Because there was no artificial storage in the mountains, late season (August and September) irrigation supply would become limited, especially in years of light winter snowfall.

By 1900, 90 percent of the approximately 5,000 inhabitants in the Owens Valley were involved in the agricultural sector [Phillips, 1967]. The Owens Valley had become a small but established agricultural area relatively early in the agricultural history of California. With the establishment of several creameries, the existence of grain warehouses, generally good crop yields, and expanding markets, the prospects for Owens Valley agriculture at the turn of the century seemed auspicious.

### The Reclamation Service and Los Angeles

In 1903, the Owens Valley was one of eight areas in California chosen by the newly established United States Reclamation Service for investigation as a possible project area. The Reclamation Service was interested in developing areas of the West that had the principle ingredients for successful agricultural production: plentiful land, potential sources of water, and a willing populace. The Owens Valley was investigated principally by J. C. Clausen, an engineer who worked in the California branch of the Reclamation Service. Clausen enthusiastically reported in 1904 that,

“Owens Valley seems to have many peculiar merits to favor it as an irrigation project. Among these may be mentioned abundance of water, power, fertile soil, genial climate, nearby markets for all agricultural products in Tonopah and Goldfield and a possible outlet to Los Angeles in the near future . . . agricultural methods compare favorably with those in average California” [United States Reclamation Service, 1904, p. 15].<sup>8</sup>

The report contained a preliminary soil survey that identified 75,000 acres of first-class farming land and 125,000 acres of potentially reclaimable second- and third-class lands. Clausen identified water supply as the limiting factor in the amount of land that could be developed. He proposed constructing a storage dam on the upper Owens River in Long Valley which would provide enough water, along with downstream supply, to irrigate 140,000 acres of first- and second-class lands. Clausen recognized that water-logged and alkali soils could limit development in some areas, but he felt proper reclamation techniques, such as drainage, could make some of those areas productive. The people of the Owens Valley, Clausen noted, were cooperative and enthusiastic about the government project and willingly signed over the storage rights for which they had previously applied.

At the same time that the Reclamation Service was investigating the Owens Valley, the City of Los Angeles was in search of an expanded water supply to sustain its growth and transformation into a major West Coast city. The Owens Valley had attracted Los Angeles interests as early as 1892, but it wasn't until the Reclamation Service's revelations about the bountiful water supply in the sparsely settled Owens River watershed, and the increasing limitations on the local Los Angeles supply, that the city seriously considered the Owens River potential. The tales of intrigue and conspiracy that are associated with the personalities in the Reclamation Service, Los Angeles, and the seemingly forsaken Owens Valley,

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<sup>8</sup>Clausen headed up the investigation which included several hydrographers and Thomas Means, who did a preliminary soil survey in the Owens Valley. Clausen was later a consultant to Owens Valley farming interests, and Means was later a consultant to Los Angeles.



have tended to obscure the actual events of the 1903 to 1907 period. Recent publications by Hoffman [1981] and Kahrl [1976, 1982] try to unravel the personalities and events. Leaving the details to those aforementioned accounts, Los Angeles was able to convince the Reclamation Service and the Theodore Roosevelt administration to abandon the Owens Valley project in favor of the Los Angeles Aqueduct for the sake of the "greatest good for the greatest number" [Schumacher, 1969, p. 194]. In later years, the Los Angeles Board of Public Service Commissioners, perhaps in an attempt to exonerate itself, stated that,

"There is considerable doubt whether the lands which would have been irrigable under the Owens Valley project, if carried out, would have been capable of producing returns sufficient to show a profit on farming over and above the cost of water and reimbursing the Government for its capital expenditures" [City of Los Angeles Board of Public Service Commissioners, 1925, p.7].

### **A Period of Tolerance**

The construction of the Owens River aqueduct began in 1907 and was completed in 1913, ahead of schedule and under budget. During this period the agricultural economy of the Owens Valley benefited from the expanded market and infusion of capital associated with the aqueduct. The aqueduct construction also brought a railroad line and an improved highway up from the south, providing an outlet for Owens Valley agricultural products to southern California. The total irrigated acreage in 1910 was higher than in 1900, though intermittently irrigated pasture accounted for most of the increase; commercial vegetable production was at an all-time reported high [United States Bureau of Census, Census of Agriculture, 1910]. Agricultural production in 1910 included: 58,000 bushels of corn, 51,000 bushels of wheat, 53,000 bushels of potatoes, 174,000 pounds of butter, 37,000 tons of alfalfa, 100 tons of honey, and 150 tons of grapes [Schumacher, 1969, p.191]. Prospects for agriculture in the Owens Valley were bright enough for the California Blue Book to forecast:

"Owens Valley is one vast seep of tillable land, only one-fourth of it as yet under cultivation, the remainder holding forth immense opportunities to homeseekers and farmers, great and small. The amount of water for both irrigation and power is unlimited. Artesian wells have been bored successfully near Independence, artesian strata varying from 25 to 500 feet in depth, and the water flows in a steady stream . . . Where sagebrush grows the rankest, there is the most fruitful soil if water can be put upon it, and there is plenty of water" [Schumacher, 1969, p. 191].

For the first eight years after Los Angeles began diverting the flow of the Owens River near Independence into the aqueduct, the city and most valley farmers were able to peacefully coexist for two principal reasons: (1) the aqueduct intake was downstream from the major agricultural

region in the Bishop and Big Pine area, and in the early years of aqueduct operation Los Angeles and most of the Owens Valley farmers obtained the water they needed, and ; (2) most of the Los Angeles-owned property was also downstream from the main agriculture area. After a constitutional amendment was passed in 1914 allowing Inyo County to tax Los Angeles properties in the Owens Valley, Los Angeles became the major contributor to the Inyo County property tax roll. Beginning in 1913, Los Angeles and the Owens Valley interests attempted to negotiate a permanent development policy for Owens Valley agriculture. The plan that was nearly consummated in 1913 guaranteed a water supply to the existing irrigation ditches, provided the Valley farmers limited their irrigation to “established” lands. Both the City and Valley interests agreed that water would in part have to be supplied by a 100 ft- (30 m-) high dam and storage reservoir in the Long Valley area. The plan, agreed to in principle by the City and the Valley representatives, fell through because of a legal challenge by a private Los Angeles citizen. Negotiations continued off and on for the following eleven years, with the City putting forth plans in 1917 and 1924 and continuing to advocate a 100 ft- (30 m-) high dam in Long Valley. Los Angeles’s proposal in 1924 called for irrigating the best 30,000 acres in the Valley. The Reclamation Service in 1921 and the Owens Valley interests in 1923 proposed constructing a 150 ft- (45 m-) high dam and consequently larger storage reservoir in Long Valley in order to assure a full aqueduct supply and an adequate irrigation supply for a minimum of 40,000 acres.<sup>9</sup> The Reclamation Service proposal was to be a joint Los Angeles and Reclamation Service project that included diverting water from the Mono Basin. Los Angeles, nevertheless, began constructing a 100 ft- (30 m-) high dam in 1923 only to be stopped by an injunction filed by Valley residents who wanted a higher dam.<sup>10</sup> Any of these proposals to provide an adequate irrigation supply to 30,000 or 40,000 acres of the “established” lands in the Owens Valley would have probably benefitted agriculture in the Owens Valley because, as it was shown later, there was not even 30,000 acres of land of high agricultural value in the northern half of the Valley. The assured supply would have

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<sup>9</sup>Owens Valley farmers formed the Owens Valley Irrigation District in 1923 and hired J. C. Clausen, the former Reclamation Service engineer, to investigate the irrigation potential from a Long Valley dam. Clausen concluded that a 150-ft high dam would be sufficient for Los Angeles Aqueduct needs and the permanent irrigation of at least 40,000 acres [Lee, 1912-1955]. The Sacramento Union published a series of articles in March, 1927, referring to engineer’s findings that show a dam 165-ft high along with proper conservation of downstream tributaries would have kept 80,000 acres of “first-class” farming land under cultivation in addition to providing “Los Angeles twice as much every day in the year as any day since the aqueduct entered service.” [Chalfant, 1933, p. 357]

<sup>10</sup>Los Angeles built a higher dam in Long Valley in the late 1930s after it gained access to Mono Basin water without Reclamation Service or Southern Sierra Power Company interference. By then Los Angeles owned most of the farmland in the Owens Valley and therefore was not obligated to provide an irrigation supply.

also provided the security necessary for the permanent cultivation of land (as opposed to the intermittent irrigation of uncultivated pasture).

The 1920 census reported an even greater amount of irrigated land than in 1910, though nearly all the increase again was in the intermittently irrigated native pasture [United States Bureau of Census, Census of Agriculture, 1920]. A detailed land-use survey of the Bishop area in 1919 showed that the majority of the cultivated land in that area was devoted to forage crops [Southern Sierra Power, 1919].

### Los Angeles Gains Control

The period of peaceful coexistence between Los Angeles and the Owens Valley ended in the early 1920s when a series of dry years (beginning in 1921), along with upstream agricultural diversions, reduced the Owens River at the aqueduct to a mere trickle. To assure more water for the aqueduct, Los Angeles began buying land and water rights in 1923. The City assumed control of two major canal companies with the intent of reducing the irrigation diversions and allowing most of the canal water to pass directly into the Owens River. These first attempts by Los Angeles failed because the other private ditches were still able to divert most of the flow of the Owens River before it got to the aqueduct intake. Los Angeles stepped up its land purchases and filed suit in May, 1924, against the other canal companies for wrongfully diverting Owens River water. The seizure of the Alabama Gates, a key aqueduct-control point, by valley residents soon followed. The repeated bombings of the aqueduct for the next three years manifested some of the dissatisfaction with Los Angeles's policies within the Valley. National media attention was focused on the Owens Valley in the 1924 to 1927 period because of what was portrayed in all but the Los Angeles press as the powerful city destroying the verdant valley.

The accounts of Los Angeles's land purchases in the 1923 to 1927 period tend to highlight some of the questionable methods Los Angeles may have employed.<sup>11</sup> Los Angeles, however, found willing sellers of agricultural land in the Owens Valley for a number of reasons. Agricultural income in the Owens Valley declined in the post-World War I depression. Outside financial institutions were unwilling to make loans to the Owens Valley farmers partly because of Los Angeles' presence. This made the capital-intensive nonforage crops more difficult to cultivate. Additionally, the nonforage crops were usually cultivated by smaller farmers who were more vulnerable to crop price fluctuations. The 1921 to 1925 dry period also imposed water-supply limitations on Owens Valley agriculture. An Owens Valley resident of this period observed:

“. . . During that dry cycle through the twenties any three of the ditches would have taken every drop of water in the Owens River; so nothing to go to

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<sup>11</sup>“Every trick and device and misrepresentation was used in the (land-buying) campaign,” according to Chalfant [1933, p. 387].

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the other eight or the aqueduct itself . . . Had the City of Los Angeles not acquired the land and water rights when they did, that there would have been civil-war amongst the farmers themselves, as to who was going to get the water.<sup>12</sup>

Agriculture in the Owens Valley had always been tough because of the vagaries of climate and water supply. One local resident observed:

“ . . . Many attempts at farming . . . were on land too alkaline, and perhaps too heavy for raising successful crops. All efforts at agriculture were subject to the unpredictable and extreme weather conditions of the Owens Valley. The lack of adequate water distribution systems was a handicap, too, especially in the southern portion of the valley” [DeDecker, 1977].

The limitations imposed by the soils were made apparent in a 1924 soil survey of the Bishop and Big Pine region (the main agricultural area) [Watson and Storie, 1928]. The survey found that only about 12 percent of the area or about 24,000 acres of land, to be of “high agricultural value, *i.e.*, soil of suitable texture and structure and free from injurious accumulations of alkali and free from an excess of stones” [Watson and Storie, 1928, p. 67]. These lands were underlain by soil classified in the Storie index as Grade 1 or Grade 2 and were located on the lower part of the alluvial fans on both sides of the valley. Another approximately 75,000 acres of the area were classified as land of low agricultural value, including areas of excessive alkali, stony, and poorly drained soils. These lands were underlain by Grade 3 and Grade 4 soils and were especially widespread immediately west, north, and east of Bishop, where much of the forage for livestock was raised (some nonforage crops were successfully cultivated on these lands as well).

Some of the farmers were therefore willing to be bought out for the relatively high prices Los Angeles was willing to pay for their land. Local opposition to Los Angeles land buying was not unified. Some, like the Watterson brothers who led the fierce opposition, demanded reparations for lost business resulting from what was perceived to be Los Angeles’s presence in the Valley. Other residents were more willing or perhaps resigned to tolerate Los Angeles’s presence in the hope that the City would allow agriculture to continue on the best lands.

The resistance to Los Angeles completely fell apart in 1927 when bank examiners found that the Watterson brothers had embezzled two million dollars from their banks in Inyo County. This revelation caused the banks to fail and to wipe out many local residents’ life savings.

After 1927, the City found little resistance to buying the remaining agricultural land in the Owens Valley, because good prices were offered during the Depression. Beginning in 1931, Los Angeles bought town properties so that by 1936, the city owned over 95 percent of the private land in the Owens Valley. The agriculture census of 1930 reflected the

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<sup>12</sup>William Symons, Jr., quoting his father [Baldwin, 1978].

decline in production of forage and nonforage crops resulting from Los Angeles's purchase and abandonment of farmland [United States Bureau of Census, Census of Agriculture, 1930]. The dramatic decrease in cultivated land by 1935 is shown by comparing the 1920 and 1935 land-use surveys of the Bishop area (see Figures 2 and 3) [Baugh, 1937]. Many farmers abruptly left the Valley, leaving behind abandoned houses and land that was quickly invaded by Rabbitbrush. The ghostly remains prompted Will Rogers in his dispatch for August 25, 1932 to write,

“Ten years ago, this was a wonderful valley with one-quarter of a million acres of fruit and alfalfa. But Los Angeles had to have more water for its Chamber of Commerce to drink more toasts to its growth, more water to dilute its orange juice, and more water for its geraniums to delight the tourists, while the giant cottonwoods have died. So, now this is the valley of desolation.”

The exaggerated emphasis on the past productivity of Owens Valley agriculture was common to many of the scathing attacks on Los Angeles in this period. The transformation of the Owens Valley in a relatively short time, from a small but viable agricultural area, to its total control by a city 250 m (415 km) away, prompted the California State Legislature to pass resolutions in 1927 and 1931 condemning Los Angeles. It also stimulated the passage in 1931 of the County of Origin Law, a law designed to prevent future unplanned transformations of rural economies (now codified in the State of California Water Code sections 10505 and 10505.5).

### Los Angeles as a Landlord

Los Angeles adopted a policy to lease back the agricultural land in the Owens Valley to farmers on a short-term (1 to 5 years) basis. The City was willing to supply irrigation water when runoff conditions permitted and after the aqueduct supply was assured. In dry years, such as 1955, no land was ostensibly supplied with irrigation water. In wet years, such as 1956 and 1958, over 60,000 acres were irrigated, although most of the irrigated land was uncultivated native pasture that Los Angeles used to spread the excess runoff. A limited amount of land (2,000 to 4,000 acres) was cultivated and seeded for livestock forage. Land-use surveys by different agencies in the same years did not agree on the amount of cultivated or total irrigated land (*e.g.*, 1950, 1959 on Table 1). This was probably because some of the cultivated forage and irrigated pasture were barely discernable from each other. Practically no nonforage crops were cultivated because the leasing policy and the uncertain and variable water supply did not justify the necessary capital expenditure for those kinds of crops.<sup>13</sup> Los Angeles also leased back its nonirrigated shrubland for cattle and sheep grazing.

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<sup>13</sup>Wood [1973, p. 5] states that from 1942 to 1944 the 10,000 Japanese in the Japanese Relocation Camp at Manzanar, “. . . had the camp producing vegetables and truck gardening like the Garden of Eden with water from the snows of Mt. Whitney generously applied to the naturally rich soil.” Manzanar was formerly a fruit-growing region.

5.4—THE DEVELOPMENT AND DECLINE OF AGRICULTURE IN THE OWENS VALLEY

Figure 2. Land use in the Bishop area, 1920. Adapted from Baugh [1937].

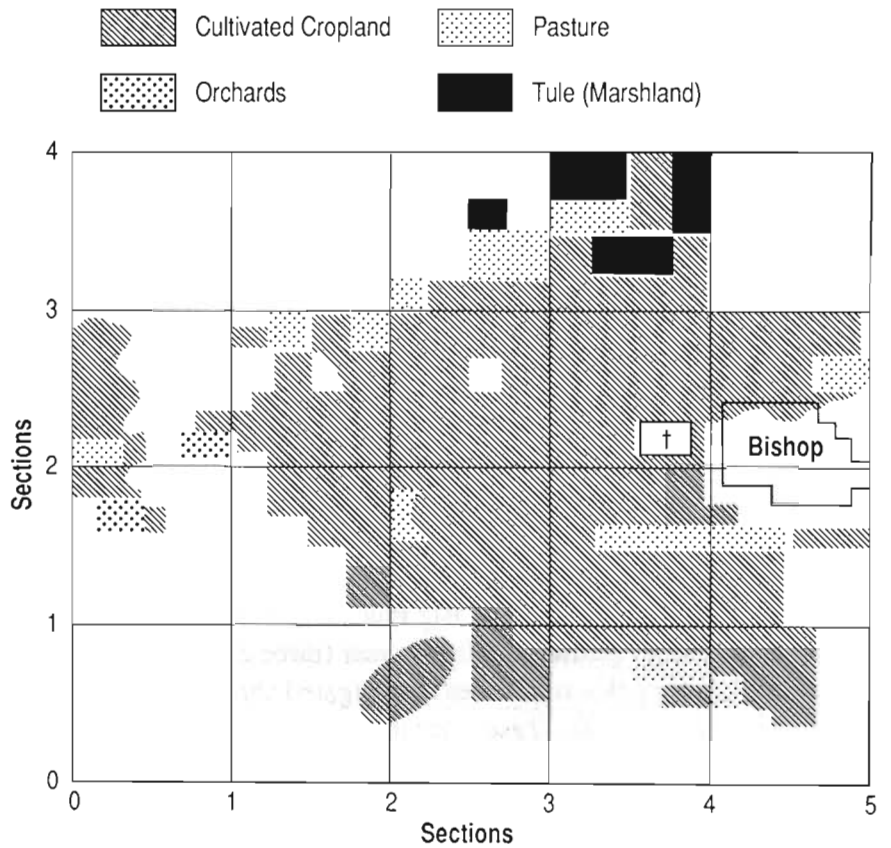
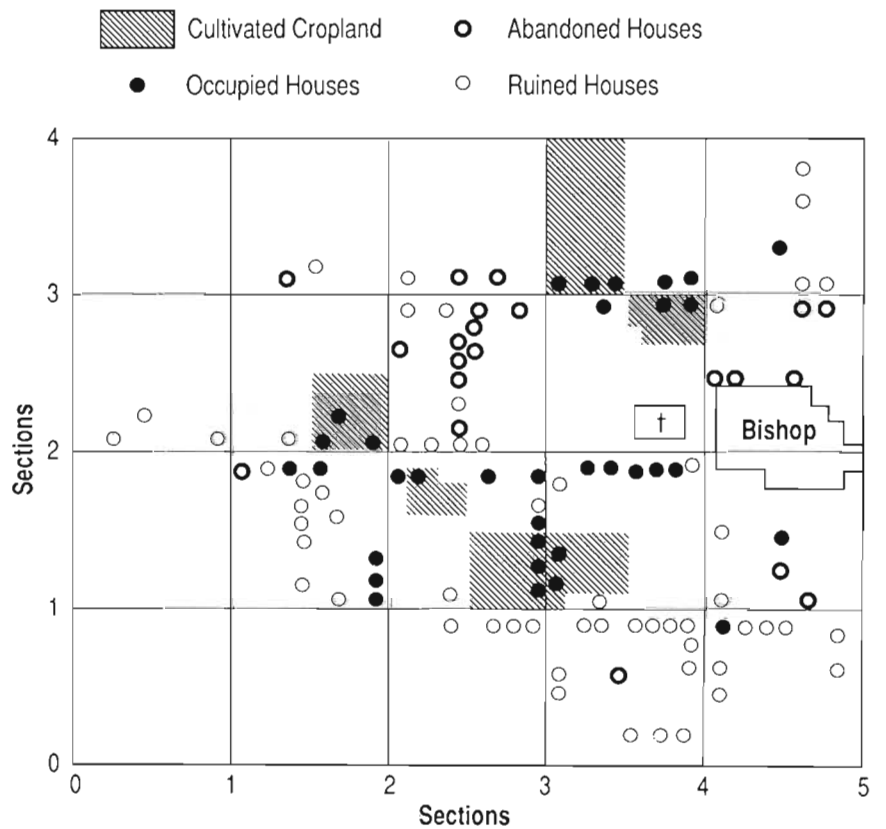


Figure 3. Land use in the Bishop area, 1935. Adapted from Baugh [1937].



Los Angeles was primarily interested in securing water for its aqueduct. The need for additional water for the second barrel of the aqueduct, completed in 1970, caused Los Angeles to overhaul its irrigation policy. Los Angeles reduced the amount of the Owens Valley land it irrigates, but currently provides a guaranteed irrigation supply to approximately 11,000 acres of land (D. Smith, pers. comm., 1981). About 3,000 acres are planted in alfalfa or other forage crops, and 8,000 acres are irrigated native pasture. Nearly all of the irrigation supply is from surface water. An exact determination of the annual amount of irrigated and cultivated land in the Owens Valley is not possible because the different land-use surveys employ somewhat different classification schemes. For example, some areas of subirrigated (by ground water) native pasture are sometimes classified as irrigated and other areas of partially seeded pasture are classified as cultivated land. Irrigation is also reduced in severe drought years, such as 1977.

Alfalfa is the principle cultivated crop and is grown in the better soils immediately south of Bishop and Big Pine. These lands yield about five to eight tons of high quality alfalfa per year (three cuttings of about two tons each). Los Angeles still leases nonirrigated shrublands for grazing, but at a substantially lower lease price than the irrigated land. Because of the generally low lease rates for both irrigated and nonirrigated City land and the existence of large areas of Federal grazing land surrounding the Owens Valley, livestock raising can be a profitable enterprise today in the Owens Valley (D. Smith, pers. comm., 1981).

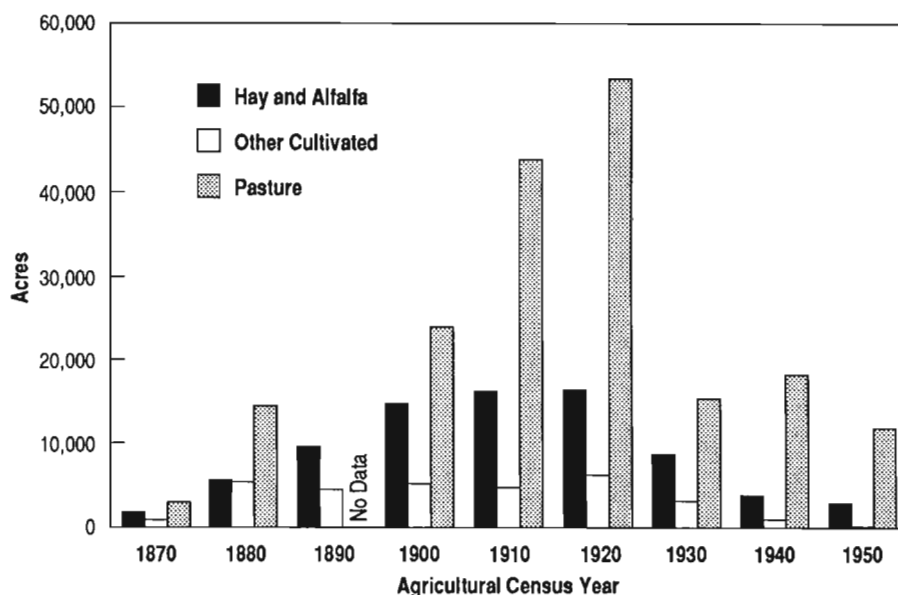
Nearly all of the agriculture in the Owens Valley is on lands owned by Los Angeles. A few remaining parcels of non-city land, including Indian lands around Bishop, are irrigated to produce forage crops. Some private citizens also raise vegetables quite successfully, which they sell to local food markets. One entrepreneur reportedly makes \$8,000 per year raising chile peppers (M. Silversher, pers. comm., 1981).

Agricultural land and water use are again a focus of controversy in the Owens Valley. Inyo County has asked for closer scrutiny of Los Angeles's irrigation policies by contesting the city's environmental impact report (EIR) on its groundwater pumping program in the Owens Valley. Los Angeles maintains that the irrigation of agricultural lands is part of its groundwater pumping program even though most of the land is irrigated by surface supply. Inyo County asserts that the City's groundwater pumping could lower the water table and damage the native pasture and grassland in the Owens Valley dependent on high groundwater levels.

## CONCLUSION

The agricultural development of the Owens Valley in the late 19th Century allowed it to become a stable agricultural region by 1900. Although most of the agriculture was geared to the livestock industry, nonforage cultivated crops were an important part of the agricultural landscape. The development of the Owens River supply as the principal

Figure 4. Change in Agricultural Acreage in the Owens Valley.



water source for Los Angeles eventually resulted in the severe reduction of irrigated agriculture in the Owens Valley. This development allowed Los Angeles to grow thirty-fold since 1900 and also converted the economic base of the Owens Valley from agriculture to tourism. Cultivated nonforage crops (*e.g.*, wheat, corn, fruit trees, *etc.*) have virtually disappeared from the Owens Valley, leaving the remaining irrigated acreage in pasture and alfalfa (Figure 4).

The land-use changes in the Owens Valley raise a number of difficult questions. What would the land-use in the Owens Valley be today without Los Angeles's ownership of 96 percent of the valley floor? Could the Owens Valley agriculture survive the inevitable private development of prime recreational land, or would strong local markets and modern reclamation technology keep the agricultural economy viable? Other less speculative questions include: what was the impact of past and present agricultural land-use on the Owens Valley soils, vegetation, and wildlife, and what is the relationship of past and present agricultural land-use on the Owens Valley groundwater and surface water hydrology (*e.g.*, what role agricultural lands have in aquifer recharge; would Owens Lake have dried up under full agricultural development)?

The development of Owens Valley agriculture could be a case study of environmental perception. People's perception of the agricultural resource and the actual resource were often far apart. Have people's perceptions of the Owens Valley agricultural resource and its transformation influenced the subsequent course of events? The Owens Valley transformation is held up as the symbol of Los Angeles's rapacious appetite for resources, but would other urban populations have acted differently given the same situation in which Los Angeles found itself? Is the Owens Valley perhaps a better symbol of the urban society's refusal to unselfishly plan for the current and future viability of the rural landscape?



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