CHAPTER 11. SOCIAL AND CULTURAL FACTORS

11.1. INTRODUCTION

The San Joaquin River has always shaped the social and cultural structure of human settlements in its valley, because the river provides the means for sustaining human populations. Water, abundant fish and game, fertile soils on floodplains and terraces, useful vegetation, and transportation were utilized by the Native American and early Euro-American settlers. Beginning in the late 1800s, floodplains and uplands were converted to agriculture, and water supply was correspondingly developed, transforming the San Joaquin Valley to a primarily agricultural-based society. Since the 1940s, the Central Valley has urbanized rapidly, and the San Joaquin River is a microcosm of the changes that have occurred in the Central Valley as a whole. The population of the Central Valley is presently over 5 million people, and is projected to triple by 2040 (USGS 1999). The City of Fresno is now the largest city in the Central Valley, and also has the fastest growing population (Figure 11-1). This urban growth has changed the social and cultural framework of the San Joaquin Valley; agricultural lands in the gravel-bedded reach near Fresno are giving way to aggregate mining in the river corridor and to urban expansion in the upland areas, which reduces the agricultural base and increases the urban base. In 1999, the United States Geologic Survey reported that the American Farmland Trust, a national organization that focuses on farmland preservation, has projected a loss of more than one million acres of Central Valley farmland by the year 2040 if current land use conversions continue (USGS 1999).

How people view the river from a social and cultural perspective will influence future restoration activity on the river. For example, Native Americans had not only a subsistence connection to the river, but a spiritual connection as well. Religious and/or ceremonial activities associated with the river, the fish, and the animals of a Tribes' territory were common. The transformation from Native American to Euro-American settlement caused drastic changes in the social and cultural structure in the San Joaquin Valley. Of all the rivers in California, the San Joaquin River is among those that have experienced the most environmental damage as its uses changed from a subsistence resource to a utilization resource (Rose 1992). The economics and politics surrounding this change in resource utilization have prevented meaningful restoration to the river over the past 60 years. There is an increasing awareness of the management impacts to the river (e.g., poor water quality, dewatering of reaches 2 & 4, and flood management) and benefits of river restoration and preservation (e.g., increased recreational opportunities, improved water quality) provides social and political opportunities for restoring the river. These social and cultural factors, as well as the potential opportunities and constraints they provide/impose, will be discussed in this chapter.

11.2. STUDY AREA

Water from the San Joaquin River is used from as far south as the edge of the Tejon Hills, Tehachapi, and San Emidio Mountains 30 miles southeast of Bakersfield, north to the Sacramento-San Joaquin Delta, and from the foothills of the Sierra Nevada to the foothills of the Coast Range. However, social and cultural issues for restoring the San Joaquin River extend far beyond the San Joaquin Valley. The social and cultural issues influencing restoration efforts on the San Joaquin River extend beyond the normal study area boundary adopted in other chapters of the Background Report. Consequently, the study area boundary for local land use issues in this chapter is the entire San Joaquin Valley, and the study area for political restoration issues is the entire State of California.

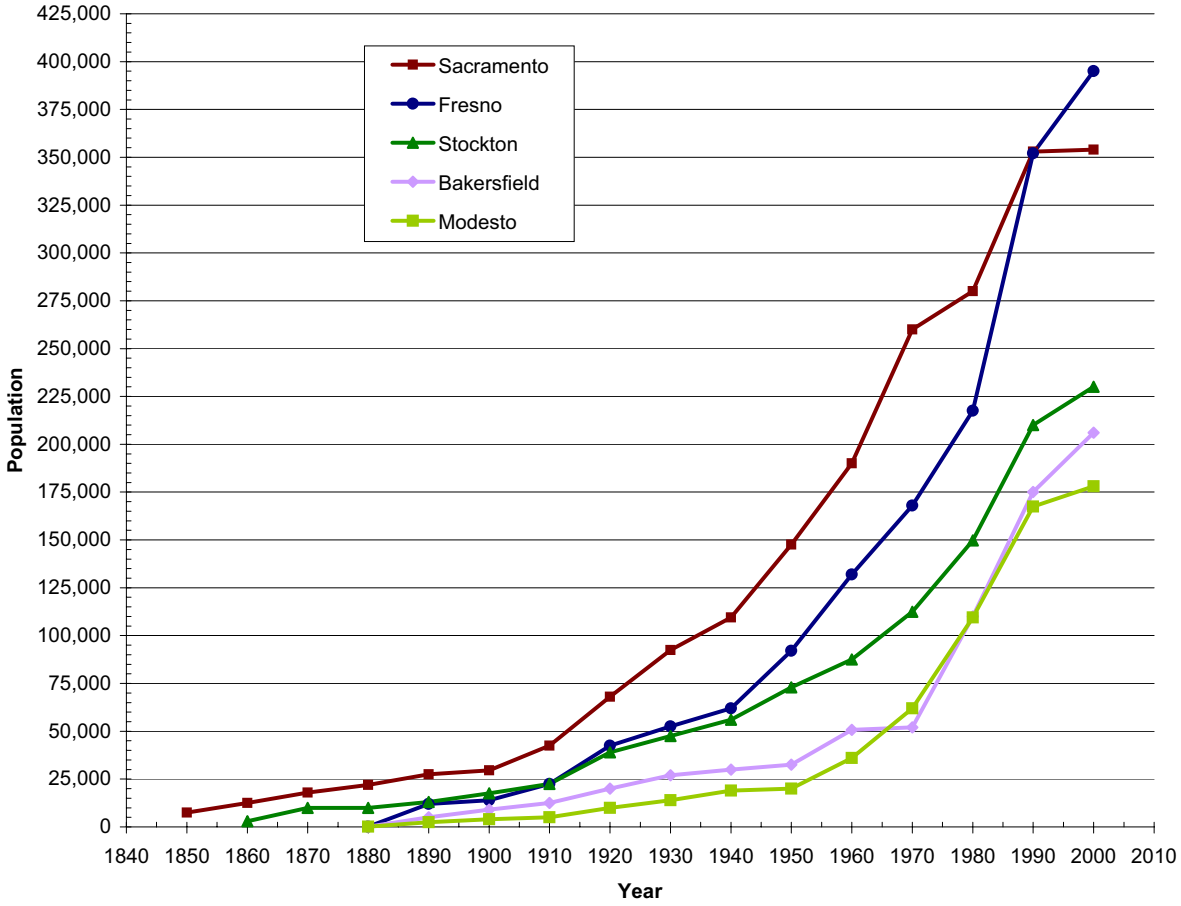

Figure 11-1. Population trends in major Central Valley cities (from USGS 1999)

11.3. OBJECTIVES

The objectives of this chapter are to discuss the general public's social and cultural perceptions that may either constrain or provide opportunities for rehabilitation of the San Joaquin River from Friant Dam to the Merced River.

11.4. SOCIAL AND CULTURAL ISSUES

People's social and cultural perspectives of the San Joaquin River can profoundly affect the river's natural environment. When Euro-American settlement increased the river's agricultural uses, droughts and floods became a larger influence in economic decisions. Now, although the San Joaquin River is an integral source of water to a highly controlled and manipulated water delivery system (primarily by the Friant Unit of the Central Valley Project), little remains of its natural riverine processes or environment below Friant Dam. This transformation in riverine processes and environment is a direct result of the dominant western political forces of the early 20th century, which engineered California's rivers into one of the largest water development and delivery systems ever created. While there was considerable social, political, and economic support in constructing the Friant Unit of the CVP, the environmentally destructive transformation of the San Joaquin River did not occur without opposition by the Department of Fish & Game, commercial fishing industry, riparian farmers below Friant Dam, and others.

A brief discussion of the dominant social and cultural issues that may influence future opportunities and constraints for restoring the San Joaquin River is provided below.

11.4.1. Subsistence

Prior to the arrival of Spaniards in the late 1700s and until the rapid immigration of American settlers in the 1850s, Native Americans subsisted on the San Joaquin River ecosystem. This direct connection between the river corridor and human survival mandated close social and cultural ties to the river. The river was lightly managed, such as harvesting of willows and grasses for baskets, harvesting of tules for boats, setting fire to oak woodlands and grasslands to promote the following year's seed crop, and other management activities. Primary food sources included acorns, salmon, waterfowl, tule roots, and possibly antelope, deer, and elk (Wallace 1978). Additional summary information on Native American use on the San Joaquin River can be found in Chapter 10; more details can be found in Wallace (1978) and Kroeber (1925). Early trappers and gold miners also depended on the San Joaquin River for subsistence, particularly for salmon, antelope, and elk. The small population of Native Americans on the San Joaquin River corridor (up to 31,000 persons as reported by Wallace 1978) resulted in small impacts to the natural environment; early trappers did not appreciably add to the human population or its resource utilization along the river.

However, large-scale immigration after 1848 transformed the cultural and social role of the San Joaquin River. Rather than an individual's dependence on the river for subsistence, larger scale grazing and crops began the transformation to subsistence for a larger community. Initially, this larger community was the gold miners in the Sierra Nevada foothills, but it has now expanded globally, with products grown in the San Joaquin Valley distributed worldwide. This regional and global expansion allows people to disassociate food from its source (the San Joaquin Valley). Farmers within the Friant Division of the CVP are still primarily small family farms; whereas larger corporate farms are becoming more dominate on the west side of the valley. This transition from small family farms to larger corporate farms has also likely caused social and cultural changes to communities along the river (e.g., less concern over land stewardship and more concern on economics). In summary, people's connectivity to the San Joaquin River has decreased over time because of the real and perceived distance between subsistence commodities directly obtained from the river corridor (e.g., fish) and commodities produced indirectly from the river (e.g., crops irrigated with water coming from a canal rather than from the river).

11.4.2. Transportation

The Native Americans concentrated their communities along the San Joaquin River, primarily along the east side of the San Joaquin Valley because favorable water and game conditions were found there. There are numerous accounts of the Native Americans using tule boats for transportation and fishing on the river and flood basins. Following the arrival of Americans in the mid-1850s, and continuing until the railroad boom of the 1870s and 1880s, the river was again used as a major transportation route in the San Joaquin Valley. Steamships made regular runs up the river, sometimes as far as Herndon, carrying manufactured goods to upriver communities, and carrying grain and livestock downstream (Brotherton 1982, Rose 1992). This early transportation dependence caused many riverside landings and communities to form along the river (Grays Landing, Firebaugh), such that the river was an important social, cultural, and economic component of these communities. The construction of the San Joaquin and Kings Canal in 1871, and the arrival of the railroad in 1872 allowed easier transportation and commodity shipping than from the San Joaquin River (Rose 1992). River-based transportation declined after the coming of the railroads, and river transportation of any significance ended in the early 20th century (Brotherton, 1982). The development of refrigerated rail

cars allowed produce produced in the San Joaquin Valley to be shipped anywhere in the country, increasing the markets available for San Joaquin Valley agriculture. The railroad spawned new towns away from the river, including Modesto, Merced, Fresno, and others. Later, in the 1960s, construction of the interstate freeway system reinforced these new and rapidly growing population centers. These towns experienced rapid growth (Figure 11-1), while riverside communities either did not grow, or declined in size. This transformation in community base added to the decrease in cultural and social valuing of the river, similar to the de-valuation of subsistence discussed above.

11.4.3. Resource utilization

Initial resource utilization by Native Americans was primarily at a subsistence level, although the Yokuts likely traded local commodities (salmon and other foods and materials) with other tribes (Wallace 1978). Muir (1917) described trade between tribes on both sides of the Sierra Nevada, where salmon and other commodities of the Central Valley were traded for obsidian obtained from the east side of the Sierra Nevada.

The next phase of resource utilization came from the beaver trappers. Jedidiah Smith was reportedly the first American to explore the San Joaquin Valley in 1826-1827, and the beaver trade flourished until the mid-1840s (Brotherton 1982, Mackie 1997). American immigrants began trickling into the San Joaquin Valley in the mid 1840s, but the beginning of the Gold Rush in 1848 opened the floodgates to large-scale immigration, and causing corresponding increases in resource utilization (Rawls and Orsi 1999). Cattle ranching and seasonal grain crops dominated in the 1850s and 1860s. The introduction of irrigation to the San Joaquin Valley by Miller and Lux, and a host of others, transformed how the San Joaquin Valley was used. Seasonal grains were replaced with a wide variety of irrigated produce. The spatial extent of agriculture enlarged laterally away from the river as the canal distribution system grew, and additional storage and distribution systems were developed (e.g., Mendota Dam, Friant Dam) (CSDE 1942, Fox 1987, Rose 1992). Construction of Friant Dam, the Friant-Kern Canal, and the Friant-Madera Canal between 1942 and 1948, and the Delta-Mendota Canal between 1946 and 1951, represented the largest component of water storage and distribution along the San Joaquin River. This extensive distribution system allowed agricultural expansion laterally away from the river and south of the San Joaquin River, further distancing the agricultural community from the river (CSDE 1992).

Gold mining in the mid to late 1800s was fairly minor in the San Joaquin River watershed, as it is on the southern extent of the mother lode (Rawls and Orsi 1999). Some gold mining occurred in tributaries upstream of Friant (e.g., Finegold Creek), but large-scale hydraulic and dredge mining does not seem to have occurred on the lower river. Examination of 1937 aerial photographs downstream of Friant shows no evidence of dredge tailings. The small gold mining communities upstream of Friant were located along the river, with the primary social and cultural connection to the river being the gold that they were in search of, as well as water supply for domestic purposes and mining. Logging in the upper watershed expanded as the foothill and valley towns sprang up with the onset of the gold rush, but the impacts from logging in the upper watershed is considered negligible compared to other direct impacts to the San Joaquin River corridor.

Later development of railroads, highways, Friant Dam, Fresno, and other communities led to growing aggregate demands to support this growing infrastructure. For example, the W.H. Hall surveys document a gravel pit upstream of the Southern Pacific Railroad Bridge in 1872 (Hall 1878 as cited in Cain 1997). The 1937 aerial photographs show gravel mining in the Friant area; gravel mining in Reach 1 of the San Joaquin River has increased dramatically in response to additional roadbuilding in the 1960s, and the continued rapid growth of the Fresno urban area. Gravel mining across all time spans has been a resource extraction commodity, and has encouraged little or no social or cultural

connection with the river other than via economic activities. The cost of providing aggregate is largely controlled by transportation expense from source to market. Most urban areas in the Central Valley are located adjacent to a river (e.g., Fresno), and simple economics will dictate that those sources of rock nearest to the market are utilized first, moving farther away from the market only as the nearer aggregate sources are exhausted or access is restricted by urban growth or land use restrictions.

11.4.4. Flood Management

Early American inhabitants along the San Joaquin River were very aware of annual flooding, particularly after the devastating flood in the winter of 1861-1862 (Rose 1992). The need to reduce flooding initiated several surveys and studies in the late 1800s. Storage reservoirs, dikes, and levees began to provide flood protection, with the largest component provided by the completion of Friant Dam (and the associated canals) in 1948. Flood management is a very important social service provided by upstream dams, protecting homes, bridges, property, and other important infrastructure built along the river. However, structural flood control gives people a false sense of security that they are "protected" from large floods and thus stimulates development within the historic flood plain supposedly protected by upstream dams and/or levees. Floods on the Mississippi River in 1993 and in the Central Valley in 1997 have shown that extensive damage can occur behind levees when the levees fail. The risk of levee failure is real; however, the perception of protection encourages development behind the levees, such that the losses when the levees fail are greater than what would have occurred without the levees because of the increased development behind the levees.

From a societal perspective, the flood management system is intended to reduce risk and concern from flooding. Efforts began in the late 1800's to initiate efforts to reduce flood induced damages, and these efforts continue today. The construction of the San Joaquin Flood Control Project in the 1960's, combined with the construction of Friant Dam in the 1940's, are the most significant components of the flood control effort along the San Joaquin River. Despite the large sums of money spent on dams, bypasses, and levees, flooding on the San Joaquin River still occurs (e.g., 1986, 1995, 1997, and 1998). These floods and others in the 1990's have raised serious questions about whether these traditional flood management projects are worth the costs, and whether society and taxpayers are realizing the anticipated benefits from these projects. Real or perceived reduction in flood management protection will cause a negative impact to those people who own or depend on those structures or properties. However, as shown many times since completion of Friant Dam (punctuated during the 1997 flood), flooding of low lying areas still occurs, with flood protection typically provided for a 50-yr flood recurrence interval. There has been an evolution from local, haphazard flood control to more regional public efforts, such as the ACOE Comprehensive Study, and the Floodplain Management Task Force. One of the primary purposes of the Comprehensive Study is to develop large scale, integrated improvements in the flood control project, and to do so in a way that improves ecological values within the flood control system. The goal of the Floodplain Management Task Force is to develop recommendations to better manage floods and the land uses within the floodplain. These efforts reinforce the fact that flooding is a significant societal issue for the public and stakeholders within the study area.

11.4.5. Population Growth

As shown on Figure 11-1, urban growth of cities along the Highway 99 corridor is rapidly expanding. For example, the population of Fresno County increased from 529,000 to 799,000 from 1981 to 2000 (US Census Bureau 2000). The demographics of valley communities continue to change as well; both Hispanic and non-Hispanic populations are increasing, with the exception of Merced County where the non-Hispanic population is decreasing slightly (Table 11-1).

Table 11-1. Demographics of Fresno, Madera, and Merced counties, which surround the San Joaquin River study area, change is for the period from 1990 to 2000 (Source: US Census Bureau data, 1999-2000).

County	Total population	Non-Hispanic population	Hispanic population	Percent Hispanic
Fresno – 1990	667,490	431,436	236,034	35.4 %
Fresno – 2000	799,407	447,771	351,636	44.0 %
Numerical Change	+131,917	+16,315	+115,602	
Percent Change	+19.7 %	+3.8 %	+49.0 %	
Madera – 1990	88,090	57,690	30,400	34.5 %
Madera – 2000	123,109	68,534	54,575	44.3 %
Numerical Change	+35,019	+10,844	+24,175	
Percent Change	+39.8 %	+18.8 %	+79.5 %	
Merced – 1990	178,403	120,296	58,107	32.6 %
Merced - 2000	210,500	115,034	95,466	45.4 %
Numerical Change	+32,097	-5,262	+37,359	
Percent Change	+18.0 %	-4.4 %	+64.3 %	

The most notable trend is the very sharp increase in the Hispanic population, as high as 79% for Madera County. The population increase in the State of California follows the trends of the three counties surrounding the San Joaquin River study area, but is not as steep. The corresponding annual population in California increased from 29,760,021 in 1990 to 33,871,648 in 2000, a 13.8 percent increase. The impacts to future restoration opportunities and constraints of this rapid demographic change and population growth in the Central Valley are somewhat unclear, thus subject to some speculation. By sheer numbers, the population growth is going to place more pressure on gravel resources; until alternative gravel sources are developed, gravel will be mined from the San Joaquin River as more homes, businesses, and roadways are constructed to accommodate this increasing population. However, the increasingly urban populations may tend to support restoration and preservation along the river to preserve and increase recreational opportunities. The formation of the highly popular American River Parkway (Sacramento) led to others, including San Joaquin River Parkway (Fresno) and Tuolumne River Regional Park (Modesto). These river parkways through urban centers are popular and well utilized by the public, and this urban parkway effort is gaining momentum to expand. Additionally, the growing Hispanic community appears to utilize these parklands extensively, such that overall use of river parklands will likely grow as urban populations increase and parkland acquisition increases.

The population increase in the State of California, as well as the potentially increasing public awareness of the ecological and recreational value of river bottomlands, has increased funding and restoration efforts on Central Valley rivers. Proposition 204 (1996), the CVPIA (1992), Proposition 50 (2002), Farm Bills, and other recently passed bond acts have drastically increased the funding for conservation easements, land preservation, and restoration.

11.4.6. Recreation

As mentioned in the previous section, the increasing population of the State and the three counties surrounding the San Joaquin River study reach has increased the recreational use of the San Joaquin River. Most recreation is focused in Reach 1 and Reach 3, particularly in the San Joaquin River Parkway lands (e.g., Lost Lake Park), and at other county and regional parks. Use of the San Joaquin

River Parkway is heaviest in the summer months, focusing on canoeing, picnicking, hiking, canoeing, jogging, bicycling, fishing, camping, bird watching, and other social activities. Typical yearly use on the Parkway varies with activity. Each year, approximately 13,000 children participate in outdoor education programs, and there are approximately 700 canoe tours. On one trail alone (Eaton Trail) there were 166,000 visits by 1,600 visitors in the previous year (Houser 2002). Approximately 91% of the visitors to the Parkway are from Fresno County, 5% from Madera County, and 4% from outside these two counties. The Parkway estimated that the economic value of recreational use of the Parkway is between $4.2 million and $7 million annually. The primary activities in the Parkway in order of use are fishing, biking, hiking, and jogging (Figure 11-2) (Houser 2002).

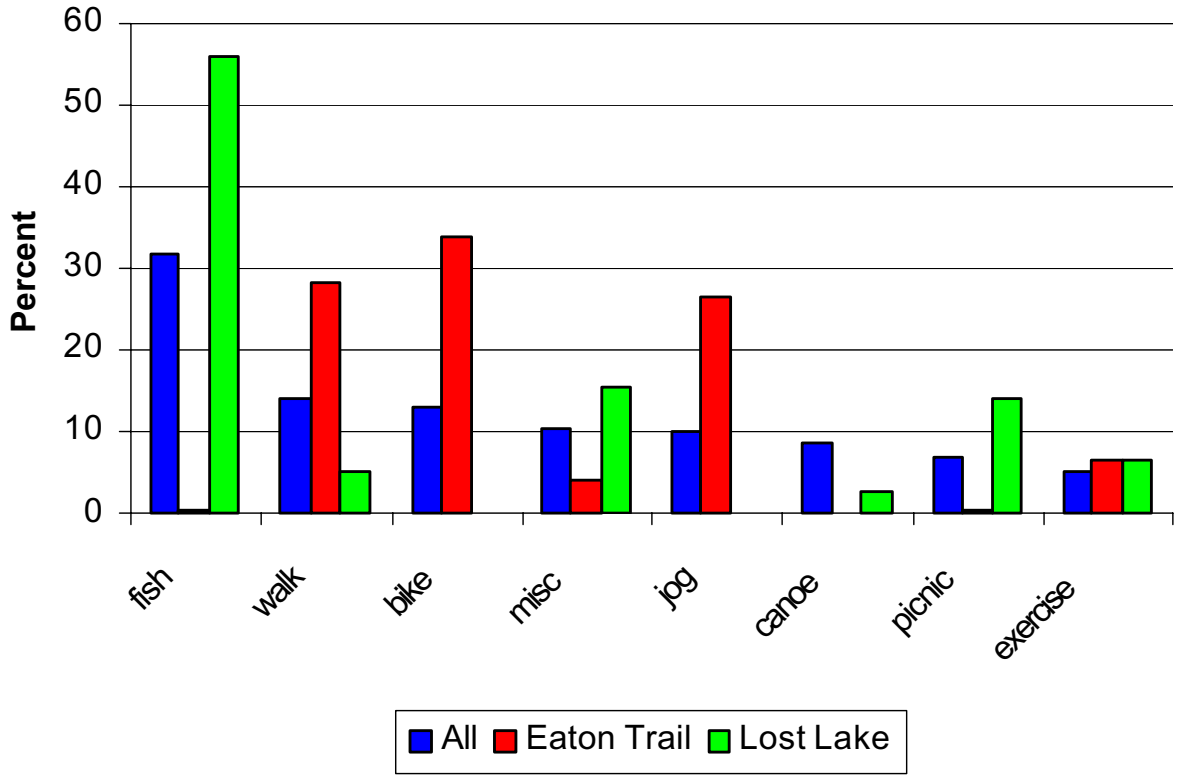

Figure 11-2. Histogram of primary recreation activities within the San Joaquin River Parkway in 2001.

A section of trail along the San Joaquin River has already been completed in Firebaugh, along with riparian vegetation plantings in the parkway. Restoring perennial flow through all reaches of the San Joaquin River, if the American River Parkway is any example should greatly increase the recreational opportunities of all reaches (over 5 million visitors per year as reported on the http: //www.sacparks.net/Parks/arp.htm website). These recreational opportunities do not necessarily come without impacts to the river. Increased public use often results in damage to streambanks and vegetation, excessive littering, illegal and prolonged camping, sanitation problems, and vandalism to both public and private property.

Restoring perennial flow through all reaches will also greatly increase fishing-based recreation, primarily resident and exotic warm water species on the short-term, and perhaps eventually adult salmon in the longer term. Recent increases in salmon populations on tributaries to the San Joaquin

River have resulted in reestablishing a sport fishery for Chinook salmon on the lower portions of the Merced River and Tuolumne River (DFG 2002). Furthermore, increasing migratory fish populations (e.g., salmonids, striped bass, sturgeon) will increase recreational fishing outside of the San Joaquin River study area. Sport fishing has been shown to provide a large financial benefit to local communities from spending on food, gas, and lodging. For example, Meyer Resources Inc (1988), as cited in Lufkin (1991), valued the Chinook salmon sport fishery in the Sacramento and San Joaquin rivers as providing net revenues to the local economy at nearly $22.00 per fish, and the total commercial Chinook fishery value at nearly $47.00 per fish. The total economic valuation of a fishery depends on the factors considered, and can be partially subjective; therefore, there is a wide range of fish "values" assigned by studies in the western United States.

11.4.7. Restoration, Preservation, and Public Health

The social and cultural issues surrounding restoration efforts on Central Valley rivers are a mixture of real and perceived issues. A common perception is that restoration and economic development cannot coexist. However, recent restoration efforts funded by CALFED, NRCS, AFRP and other funding sources have shown that restoration efforts can coexist with, and even mutually benefit, land uses that have historically been assumed to be incompatible with restoration. For example, the growing awareness of the true flood risk to low lying agricultural and urban lands (e.g., 1997 flood) has allowed many conservation easement programs to develop mutually beneficial solutions to these low lying areas. Conservation easements can compensate the landowner for a large portion of the fee-title value of the land, allow many of the historical uses to continue, retain riparian water rights, and revegetate portions of the land to native riparian vegetation. Depending on the landowner, fee title purchases can be a preferable alternative. Regardless, voluntary programs of conservation easements, mineral rights purchases, and/or fee title purchases to willing sellers have been very successful on several Central Valley rivers. These cooperative efforts are beginning to break down the misperceptions that restoration and preservation efforts are universally conflicting with agricultural production. Future restoration and preservation efforts will benefit as this realization spreads to the San Joaquin River. Recent efforts by the San Joaquin River Parkway provide a good example of this changing perception (Fresno Bee 1999).

Restoration and preservation efforts often have economic benefits to local communities. Restoration and/or preservation of river bottomlands often increase the value of surrounding private lands, particularly in urban areas where existing or future home sites are or would be located. Restoration efforts also improve the aesthetic value of river bottomlands, which again increase surrounding land values and increase river usage by the public. Lastly, restoration activities can provide significant economic benefits to the local economy. Ongoing restoration activities on the Tuolumne River has provided tens of millions of dollars to the local economy as construction contractors, revegetation contractors, aggregate companies, and local landowners are funded to implement the projects.

11.5. HISTORICAL TO CONTEMPORARY PERSPECTIVE

The general public's social and cultural perspectives towards the San Joaquin River closely follow land use patterns through time. For that reason, describing the historical social and cultural perspectives is best done using a timeline of general land use trends. These social and cultural perspectives continuously evolve as the needs and population of the San Joaquin Valley change over time. This historical review of social and cultural perspectives is valuable to assess how current social and cultural issues are a product of changes in earlier perspectives.

11.5.0.1. Prior to 1832: Native American Period

The Yokut people lived in the San Joaquin Valley harvesting the bounty from its interlinked grassland, tule-flood basins, riparian, and aquatic environments. At the time of first contact with European culture, it is estimated that over 31,000 Native Americans lived in the San Joaquin Valley (Wallace 1978). Social and cultural life in the San Joaquin Valley was centered on the San Joaquin River and its associated lake, flood basin, and slough ecosystems, which supported one the highest densities of native people in California. During this period, the first European descendants entered the San Joaquin River valley, introducing exotic animals, plants, and diseases that would forever change the valley and its original peoples (Gutierrez and Orsi 1998).

11.5.0.2. 1832 to 1848: Trappers and Mexican Land Grants

French Canadians from the Hudson Bay Company established a base at French Camp near Stockton; from there they lived and trapped beaver (Mackie 1997). Just about the time that the beaver and the trappers were gone, the Mexican government granted its first of several vast land holdings to private citizens (Perez 1996). When gold was discovered, the Mexican Rancheros' had built up vast herds of cattle for the tallow and hide trade. Cattle were allowed to graze in the natural grasslands and riparian habitats of the San Joaquin Valley. The social or cultural perspectives at this time were centered on extracting natural resources from environments of the San Joaquin River for financial gain of the few people who owned the Ranchos, and there was little inclination to permanently settle and develop the land (Gutierrez and Orsi 1998).

11.5.0.3. 1848 to 1870: Gold Rush and Dry Land Farming

Starting with the discovery of gold, the population within the San Joaquin Valley increased dramatically, with hordes of people seeking quick riches in the streams leaving the Sierra Nevada foothills. It was during this period that agriculture had its beginnings. Initially, agriculture was limited to the basic needs of feeding the miners, cattle grazing and dry land farming along the San Joaquin River and its tributaries (Rawls and Orsi 1999). This was a period when vast land holdings dominated the San Joaquin Valley, starting with the Mexican land grants and ending with the vast swamp and overflowed landholdings acquired by the Miller & Lux partnership. Steamers plying the river and its tributaries stopped at farmers' landings, and many river towns sprang up along the rivers to ship products to San Francisco. Steamships were the primary means of commercial transportation at this time. The San Joaquin River and its natural environments were important from a social or cultural perspective during this time (Rose 1992). Landowners who ran livestock in the riparian forests and tule marshes began reclaiming riparian forests and tule marshes for agriculture, and began diverting water from the river to irrigate crops. Their dependence on the river and rainfall for crops caused a fairly close connection to the river, and they prospered based on the frequency and duration of floods and droughts in the San Joaquin Valley.

11.5.0.4. 1871 to 1951: Railroads, Irrigation, and Agricultural Expansion

Agriculture dependence on river flows, and the corresponding risk of droughts, led to efforts to increase the amount, distribution, and reliability of water supplies. In many areas, artesian springs, artesian wells, and groundwater pumping began in the 1870s, initiating the groundwater overdraft problems that exist today (see Chapter 5 for more detail). The need for more reliable water supplies led to the construction of Mendota Dam and San Joaquin and Kings River Canal by the Miller & Lux partnership in the 1870s (CSDE 1942, Rose 1992). About the same time, rapid railroad expansion provided alternative commercial shipping routes, such that steamship commerce ended by the early

1900s. The Mendota Dam and associated canals expanded agriculture in Reaches 3 and 4; yet, upstream reaches and potential agricultural lands farther away from the channel still did not have reliable water supplies. During the Great Depression, development of the Central Valley Project began, resulting in water being delivered to farmers on the east side of the San Joaquin River through the Friant-Madera Canal and the Friant-Kern Canal; the Delta-Mendota Canal delivered water to west side farmers (CSDE 1942, Rose 1992).

Beginning with the construction of Mendota Dam in 1871, the diversion of the river into canals, and the arrival of the railroad marked the end of an era when the San Joaquin River was the focal point of life in the San Joaquin Valley. The steamers began to disappear, as did many of the river towns and landings, and agriculture was no longer limited to lands served by riparian water rights. This period saw a tremendous expansion in the network of dams, canals, levees, railroads and highways that serve the San Joaquin Valley. Although the rivers were still sources of water, they ceased to be the focal points for society and culture (CSDE 1942, Rose 1992).

11.5.0.5. 1951 to 1978: Post-Friant Dam period

Culminating in the completion of the Friant Unit and Delta-Mendota Canal portions of the Central Valley Project, this was a period of rapid agricultural growth. This also ushered in the era when the San Joaquin River became permanently dewatered (except for infrequent flood management releases) in Reach 2 and Reach 4. By the beginning of this period, spring-run Chinook salmon, fall-run Chinook salmon and steelhead trout had disappeared from the San Joaquin River below Friant Dam, downriver to the confluence of the Merced River (Lufkin 1991). The prevailing social, cultural, and political view during this period was that the resources of the river should be used in the most beneficial way possible for the greatest number of people, which at the time was considered to be for agricultural purposes on non-riparian lands (Rose 1992). This view resulted in dewatered reaches of the river, levees constructed to narrow and confine the floodway, reclamation of floodplains and wetlands for agriculture, and construction of flood bypasses to efficiently route floodwaters through the basin. This view of using federally impounded water for use on non-riparian lands was not specific to the San Joaquin Valley, as this approach was widely applied to rivers throughout the West. The main distinction of the San Joaquin River from other rivers was that most fish and wildlife considerations were not included when developing management protocols on the San Joaquin River, which resulted in the extirpation of salmon and steelhead, and great reductions in riparian habitat along the river. Perhaps the perspective of the time was best expressed by Governor Edmund G. "Pat" Brown (quoted by Fresno Bee in 1999):

> *"It is believed that…releases from Friant Dam [for the preservation of fish] would indeed constitute 'a waste of water' in view of the grave need of all available water for higher use elsewhere"*

Riparian property owners, scientific experts, conservationists, CDFG, and commercial and sport fishing industry did object to the management of the San Joaquin River, and they were ultimately supported by Judge Hall's 1956 decision (Rank v. Krug) that the federal government was illegally storing the state's water behind Friant Dam. When the Bureau applied to the State Water Board for water rights at its Friant Dam diversion, CDFG's protests were undermined by Edmund G. "Pat" Brown (as State Attorney General, Opinion 1951), who stated that the dam's purpose was not for fish, but rather for irrigation. Such views greatly overwhelmed other social, cultural, and political forces favoring more moderate resource utilization of the San Joaquin River (Rose 1992, Fresno Bee 1999).

11.5.0.6. 1978 to 2002: Beginning of the Restoration Effort

The legal interpretation of the Federal responsibility for instream flows began to change in 1978 when the U.S. Supreme Court held that federal agencies must follow state laws (such as releasing sufficient water to support fish below any dam or diversion) unless the state laws are inconsistent with congressional intent. This began the evolution away from the perspectives expressed in Governor Pat Brown's time (Rose 1992, Fresno Bee 1999). In the 1970s, a host of significant Federal and State environmental laws (e.g., Endangered Species Act, National Environmental Policy Act, California Environmental Quality Act, and others) were enacted to protect species and the environment, and the passage of these laws reflected a significant shift in perspective on how society manages rivers. In 1988, the NRDC and 14 other groups filed suit against the federal government over its renewal of water contracts without first taking into account the effects to fish, wildlife, and river habitat. This litigation was the first of many environmental lawsuits to follow in the San Joaquin Valley (Rose 1992, Fresno Bee 1999). In the 1990s, Congress and the State Legislature passed several laws that created restoration programs to protect and restore the lower San Joaquin River, such as the CVPIA's Anadromous Fish Restoration Program, CALFED's Ecosystem Restoration program, San Joaquin River Group's Vernalis Adaptive Management Plan, AB 3048's San Joaquin River Management Program, and the San Joaquin River Conservancy-San Joaquin River Parkway Master Plan. In 1997, American Rivers designated the San Joaquin River as one of the ten most endangered rivers in the country. Also in 1997, the Bureau of Reclamation, Friant Water Users Association, and NRDC jointly formed the San Joaquin River Riparian Habitat Restoration Program to begin developing mutually acceptable restoration activities, and in 1999, water was released from Friant Dam as a pilot project to restore riparian vegetation in Reach 2 of the San Joaquin River.

Since 1980, and especially in recent years, there has been a steady decline in the price index of certain agricultural commodities, due in part to globalization (Sumner, 2001) (Figure 11-3). Agriculture is and will continue to be the dominant land use in the San Joaquin Valley. Over 15,000 farmers cultivate 1 million acres of agricultural land that receive San Joaquin River water from the Central Valley Project, producing over $2 billion dollars of agricultural products annually. An additional 2 million acres of agricultural land receive northern California water from the State Water Project, producing another $2 billion dollars of agricultural products annually (Fresno Bee 1999). Although the San Joaquin Valley is rapidly urbanizing, over 3 million acres of productive agriculture land lie on the east and west sides of the San Joaquin Valley. In a state that leads the nation in agricultural production, San Joaquin Valley farm products account for more than half of California's $26.8 billion annual production (Fresno Bee 1999). The San Joaquin Valley also has the fastest growing urban population in California, which is expected to triple from 5 million people today to 15 million people by 2040 (USGS 1999). A plethora of interests compete for the water of the San Joaquin River and its former flood basin lands. The primary challenge is to achieve a balance among these interests if the San Joaquin River is ever to be restored to support additional riparian habitat, re-establish anadromous salmonids, and increase wildlife populations and diversity.

11.6. OPPORTUNITIES AND CONSTRAINTS

It would be simplistic to characterize the social and cultural issues surrounding the San Joaquin River today as just manifestations of a "farmland versus river restoration" conflict. The general public has several significant social and cultural concerns regarding the future of the San Joaquin River that can be summarized as: 1) securing/preserving an adequate water supply, 2) improving water quality, 3) preserving agricultural production in the San Joaquin Valley, 4) meeting the recreational needs of the rapidly growing urban centers, and 5) protecting and rehabilitating the San Joaquin River. Social and cultural issues surrounding each of these concerns pose opportunities and constraints to future restoration of the San Joaquin River.

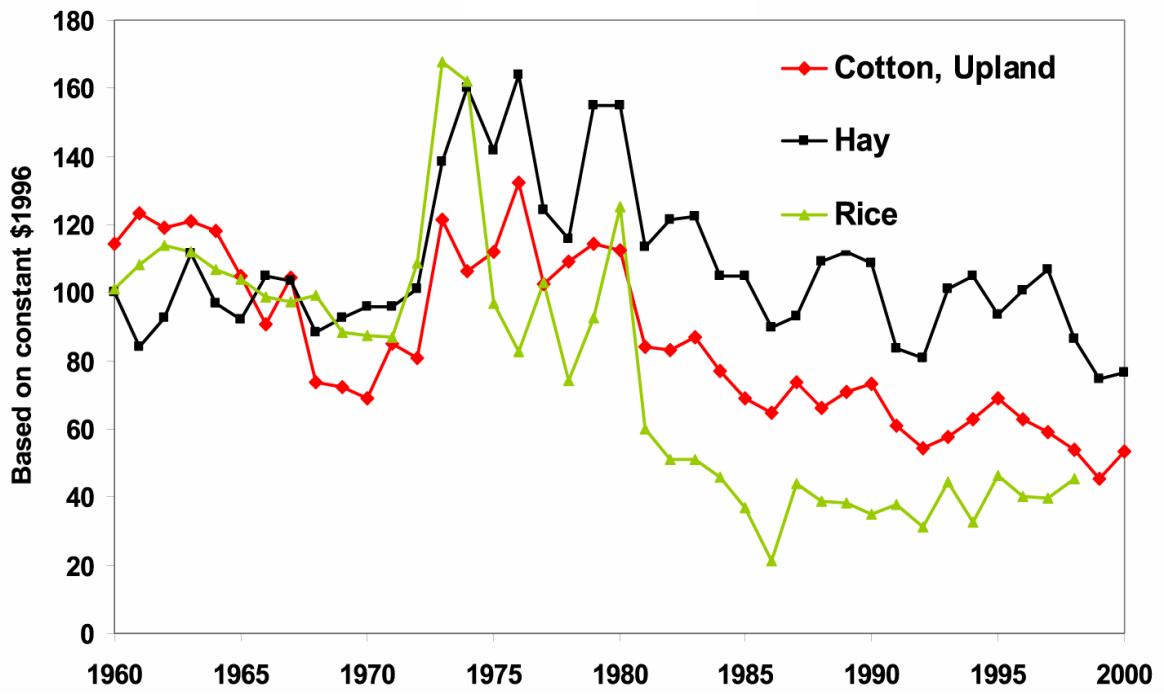

Figure 11-3. Summary of price indices for California field crops between 1960 and 2000 (in 1996 dollars).

11.6.1. Opportunities

Opportunities for future restoration provided by social and cultural issues include:

- Flood management: The existing flood management system does not provide an adequate level of flood protection in downstream reaches. Potential restoration actions that would improve flood management include purchasing flood easements and fee title from willing sellers in flood prone lands, setting back levees, and increasing flood storage in floodplains. Additionally, in many instances, the limited economic value of the lands protected by physical structures does not justify the high cost of creating the protective structures. However, the combination of levee setbacks and/or floodway easements with riparian restoration increases the overall value of the project. This is particularly true in flood-prone agricultural lands where certain seasonal crops can be grown that are compatible with ecological functions (e.g., Yolo Bypass). All of these actions could provide additional flood protection while encouraging restoration. Social and cultural concerns will benefit from additional flood protection.
- Recreation: Restoration of perennial streamflows, as well as additions to river parkways, will increase recreational use along the river (picnicking, hiking, biking, boating, camping, etc.). Restoration of streamflows will benefit resident fish, increasing populations and supporting a sport fishery of these species. Additionally, restoring salmon to the San Joaquin River will provide additional recreational fishery in the Delta and ocean, and may someday provide an in-river fishery as now exists on the lower Tuolumne and Merced rivers. Cumulatively, improved recreational use of the river brings money to the surrounding communities from both the local population as well as outside sources.

- General Public Perception: Public perception of river bottomlands has gradually changed since the 1970s, increasing the importance of healthy river ecosystems from social, cultural, and economic perspectives. This perception is anticipated to continue growing in the future, providing improved public support for restoration efforts on the San Joaquin River
- Local Public Perception: Local perspectives may also be changing, as local landowner fear of restoration activities diminish due to positive restoration-landowner collaborations on other regional rivers. Additionally, clean up efforts conducted by the San Joaquin River Regional Parkway, Bureau of Reclamation, and others have increased over the years, further indicating increasing public recognition of the river as an intrinsically valuable resource.
- Economics: Since 1980, agricultural commodity prices have been declining, making conservation easements a much more attractive option for farmers to retire marginal flood-prone lands with low value crops. Restoration efforts also bring substantial sources of revenue to the local economy from both the recreational uses, and the restoration activities themselves. Tributaries to the San Joaquin River that have received large grants for performing floodway restoration projects have benefited from millions of dollars poured into the local construction, trucking, aggregate, and nursery plant industry.
- Restoration Funding: Our society, through a variety of bonds and public laws, clearly supports restoration of river bottomlands. CALFED, CVPIA, and other funding sources have and will continue to provide large amounts of funding to future restoration efforts on the San Joaquin River.
- Farmland: Frequently flooded lands are often marginal for agriculture due to prolonged periods of inundation or seepage, and sometimes from topographic damage from breached levees and sand deposition. These economically marginal lands create opportunities to purchase for floodway or conservation easements, providing the local landowner an economically preferable way of extracting these marginal lands from production and maintenance liability. For fee title purchases, fair market value is paid, and for conservation easements, a majority of the fair market value is paid and the landowner retains ownership and many of the associated rights of land ownership (e.g., riparian water rights). This voluntary approach does not conflict with local desires to retain private ownership and property rights. When compared to urban expansion to river bottomlands, farmland is generally more compatible with restoration because there is more flexibility in flood management and water supply as opposed to the more fixed urban demands. Monetary damage, cost to protect, and risk of loss of life is also much lower for farmlands compared to urban development.
- Water Quality: The absence of perennial flows in the San Joaquin River has created major water quality and public health problems all along the river and through the Delta; improved San Joaquin River flows will improve water quality and help address many of these problems. Additionally, water imported to Reach 3 by the Delta-Mendota Canal is poorer quality than San Joaquin River water from Friant Dam, and combined with the agricultural runoff of this Delta water from saline soils on the west side of the valley in Reaches 4 and 5, cumulatively causes extremely degraded water quality on the lower San Joaquin River. The poor water quality in Reaches 3, 4, and 5 (and downstream reaches) negatively impacts public health and society that uses this water downstream. Extensive water treatment is applied to improve this water quality; thus improving water quality by increasing instream flows (dilution). Reducing agricultural point and non-point sources of contaminants represents a restoration opportunity that will benefit society in addition to river health. Reducing the amount of Delta water in the San Joaquin River (with its high salinity) will improve water quality for downriver water users and aquatic habitat.

- Expanding Existing Parklands: The City of Fresno is the largest and fastest growing urban area in the Central Valley, and the San Joaquin River traverses its northern border. The San Joaquin River Parkway represents an important social and cultural foundation for the greater Fresno area, and the Parkway's desire to expand to a 6,000 acre corridor between Friant Dam to the Highway 99 Bridge will provide a significant land base from which to restore the river. The 22-mile reach from Friant Dam to Highway 99 has the greatest opportunity for an urban population to benefit from rehabilitating the San Joaquin River. Potential future expansion of the San Joaquin River Parkway downriver below the Highway 99 Bridge, consistent with the General Plans of Fresno and Madera counties, would continue the preservation and recreational benefit of any increases in flow below Friant Dam. Developing public access trails and educational programs is an excellent way to increase public awareness of the San Joaquin River while providing for passive recreational opportunities. Like the American River Parkway, there is also a tremendous opportunity to increase recreational use in the San Joaquin River Parkway if the river received sufficient flows to restore public navigation and boating along its 22-mile corridor.

11.6.2. Constraints

Constraints for future restoration provided by social and cultural issues include:

- Flood management: The old paradigm for flood management was to build large dams to reduce or eliminate flood peaks, and to construct levees to confine floodwaters to a narrow width. This approach depends on engineering and structural approaches, and is prone to large scale failure when one component fails (e.g., breached levee). The emerging new paradigm incorporates engineering with ecological restoration to improve flood management flexibility (e.g., setting back levees to enable dam operators to release larger flood control releases in a safe manner), increase ecological health of the river corridor, and reduce risk of failure in the flood control system (e.g., increased floodway width reduces velocities and water heights, thus reducing the probability of levee failure). Restoring floodplains and flood basins, revegetating floodplains, and increasing floodway width, are the new approaches that are now being implemented on other river systems. The ACOE is now statutorily required to consider non-structural alternatives, and some of the most successful flood management projects in recent years (Napa River, Yolo Bypass) have embodied this new approach. However, this approach is not yet fully accepted by many flood prone property owners, the public, and regulatory agencies responsible for flood protection. While the perception that restoration impairs flood management is slowly receding, it still represents a significant social and cultural constraint to future restoration efforts.
- Landowner Public Perception: The public often fears change of the status quo, which can create a social/cultural impediment to restoration especially on the scale that is contemplated for the San Joaquin River. Another traditional perception is that river restoration is incompatible with agriculture. Concerns about government "taking" private property, removing agricultural land from production, reducing water supply, impairing private property rights, increasing maintenance, and impairing flood management are constraints to restoration that will need to be resolved on a case-by-case basis. While there are obvious conflicts between the two, there are often many mutual benefits that can be achieved if the groups are willing to communicate.
- Water Supply: Depending on the restoration and water supply strategy developed as part of the Friant-NRDC Settlement Agreement process, the water supply to agricultural and municipal water customers could be negatively impacted by restoration efforts, which will

have impacts to social and cultural issues of those communities. These restoration efforts could also potentially impede the rapid growth of regional urban areas along the Highway 99 corridor.

- Poaching: Restoring native resident fishes, particularly anadromous salmonids, will likely increase poaching pressure. There are numerous historical accounts of salmon poaching on the last San Joaquin River salmon in the 1940s, and future poaching of adults after salmon are restored to the San Joaquin River will represent a constraint to restoration efforts. Public education, and ultimately enforcement of poaching laws, will be required as part of the restoration effort.
- Trespassing and Vandalism: Additional public access to the river increases the likelihood of vandalism to parkland structures, and increases trespassing and vandalism to adjoining private properties. Enforcement, public education, and access restrictions are potential solutions, but societal fear of increased trespassing and vandalism represents a potential constraint to increasing public parklands.
- Reduction in Salmonid Predators: Restoring salmon populations may require reductions in fish species that feed on juveniles outmigrating from the San Joaquin River. Approaches include filling gravel pits, netting, electroshocking, and conducting fishing derbies to reduce predator populations. However, many anglers enjoy fishing for these predatory species (e.g., smallmouth bass, largemouth bass, red-eye bass), and these recreation users may not support efforts to reduce bass populations or their habitat in favor of protecting juvenile salmonids.
- Illegal Dumping and Littering: The low value historically placed on the San Joaquin River has allowed pervasive illegal dumping and littering along the river, and this lingering perception will continue to be a constraint to restoration, particularly in public areas with inadequate patrolling and isolated private lands shielded from view by law enforcement agencies. For example, along the stretch of river through the San Joaquin River Parkway, 609 tires were removed this year alone; about 2,434 tires have been removed since the Parkway cleanup program began (San Joaquin River Parkway Website, August 2002).
- Trust, Communication, and Polarization: Restoration planning efforts done under a court settlement agreement process is usually done without significant public input, updates, or participation. Lack of public information often generates suspicion of restoration efforts, which may polarize certain groups within the local community, making future restoration efforts more difficult.
- Gravel supply: Restoration and/or preservation in the gravel bedded reaches of the San Joaquin River takes aggregate out of commercial production, causing a potential constraint for future aggregate supplies needed to support infrastructure and growth in surrounding communities. This was one of the more significant concerns expressed by the public and aggregate industry responding to CEQA/NEPA documents for large scale restoration projects on the Tuolumne River. Continued urban growth in Fresno and Madera Counties will maintain or increase demand for aggregate products that historically have been supplied by gravel mining in the San Joaquin River Corridor.
- Cost: While society has made commitments to expend larger amounts of money on restoration and preservation efforts, the large cost anticipated to restore the San Joaquin River may impose a societal constraint if the costs are greater than society is willing to bear.
- Restoring Natural River Processes: The common public perceptions of flooding, bed movement, channel migration, and channel avulsion are that these processes are to be avoided, rather than embraced. These processes are the primary physical agents that create

and maintain healthy river ecosystems; however, society has typically responded to these processes with rip-rap, levees, and dams. Educating the large number of adjacent landowners, and restoring these processes without corresponding structures added to stop the processes, will be a significant constraint to future restoration efforts.

11.7. LITERATURE CITED

Brotherton, I. N. J., 1982. *Annals of Stanislaus County: Volume 1-river towns and ferries*. Western Tanager Press. Santa Cruz, CA.

Cain, J.R., 1997. *Hydrologic and geomorphic changes to the San Joaquin River between Friant Dam and Gravelly Ford and implications for restoration of Chinook salmon*, MLA Thesis, University of California, Berkeley, CA.

Sumner, D. 2001. California agriculture; trends, issues, and outlook, presentation at Executive Seminar on Agricultural Issues, University of California Agricultural Issues Center, and Department of Agricultural and Resource Economics, University of California, Davis.

California State Department of Education (CSDE), 1942. *The Central Valley Project*. Sacramento, CA.

California Department of Fish and Game (DFG), 2002. *Freshwater sport fishing regulations*, Sacramento, CA, 70 p.

Fox, P., 1987. *Freshwater inflow to San Francisco Bay under natural conditions*. Appendix 2, State Water Contractors' Exhibit Number 262.

Fresno Bee, 1999. A Special Report: Rescuing the San Joaquin, Fresno, California, http://www.fresnobee.com/man/projects/savesjr/flow/html.

Gutierrez, R. A., R. J. Orsi, 1998. *Contested Eden: California before the gold rush*. University of California Press. Berkeley, CA.

Hall, W.H., 1878. Transit books for 1878, State Engineers office, Sacramento, CA.

Houser, S., 2002. Estimating the Recreational Value of the San Joaquin River Parkway. California State University at Fresno. Fresno, CA.

Lufkin, A., 1991. *California's Salmon and Steelhead: The Struggle to Restore an Imperiled Resource*. University of California Press. Berkeley, CA.

Mackie, R. S., 1997. *Trading Beyond the Mountains: The British Fur Trade on the Pacific, 1793-1843*. University British Columbia Press. Vancouver, British Columbia.

Muir, J., 1894. *The Mountains of California*. The Century Company. New York.

Perez, C. N., 1996. *Land Grants in Alta California: A Compilation of Spanish and Mexican private land claims in the State of California*, Landmark Enterprises, Rancho Cordova, CA.

Rawls, J. J. and R. J. Orsi., 1999. *A Golden State: Mining and Economic Development in Gold Rush California*, University of California Press, Berkeley, CA.

U.S. Census Bureau, 2000. Census 2000 Data, Washington D.C., http://www.census2000.gov.

U.S. Geological Survey (USGS), 1999. Preliminary Assessment of Urban Growth in California's Central Valley. http://ceres.ca.gov/calsip/cv/project.html

Wallace, J. W., 1978. Northern Valley Yokuts, in *Handbook of North American Indians*, Volume 8: California, editor Robert F. Heizer. Smithsonian Institution. Washington D.C.