PART III

THE ENVIRONMENTAL SETTING

INTRODUCTION

Part III describes the environmental setting of the City of Isleton and its surrounding area . Part III meets the requirements for describing the environmental setting as set forth in California Environmental Quality Act Guidelines for preparing the Environmental Impact Report required for the General Plan contained in Part VIII of this report.

REGIONAL PERSPECTIVE

The location of the City of Isleton in the region is shown on Figure III-1. Isleton is located on Brannon Island along the Sacramento River about five miles upstream from the City of Rio Vista and 10 miles downstream from the community of Walnut Grove. Isleton is also located within one of the most ecologically complex regions of the state -- the Sacramento-San Joaquin Delta. The Delta contains much of California's remaining wetlands, significant fisheries and wildlife habitat, highly productive agricultural lands, water resource facilities critical to the statewide system of water distribution, and major recreation resources.

LAND USE

The environmental setting of the Isleton Planning Area is dominated by the Sacramento River on the north, Georgiana Slough on the south and agricultural lands which border the City on the south, east and west. Virtually all urban uses are located within the City limits which encompasses an area of approximately 235.0 acres. As shown on Figure III-2, the planning area encompasses a much broader area than is expected to urbanize as part of the City in the future. The City's current Sphere of Influence boundary is almost entirely conterminous with the City Limits, with the exception of a short leg extending east along Isleton Road. Thus, only those vacant parcels within the City are currently available for urban expansion, and only modest acreage remains inside the City to accommodate additional residential use. Most of the remaining vacant acreage is located within the City's Redevelopment Project Area at the easterly end of the City, between "H" Street and Tyler Island Bridge Road. A summary of existing land use is shown in Table III-1.

TRANSPORTATION AND CIRCULATION

Primary transportation and circulation facilities connecting Isleton with the region include State Route 160, Terminous Road, State Route 12, Walnut Grove Road and Twin Cities Road. State Route 160 is a levee highway along the Sacramento River. It runs through the City, providing access to Rio Vista and other points to the west in Solano County (via State Route 12), to Antioch in San Joaquin County and to Walnut Grove and other communities to the north along the Sacramento River. Terminous Road connects the City with State Route 12; State Route 12 connects the Isleton area with Interstate 80 at Fairfield, with Interstate 5 north of Stockton and with State Route 99 at Lodi. Access to Interstate 5 is also provided by Walnut Grove Road between Rio Vista and Thornton, and by Twin Cities Road north of the town of Locke.

FIGURE III-1

LOCATION IN THE REGION

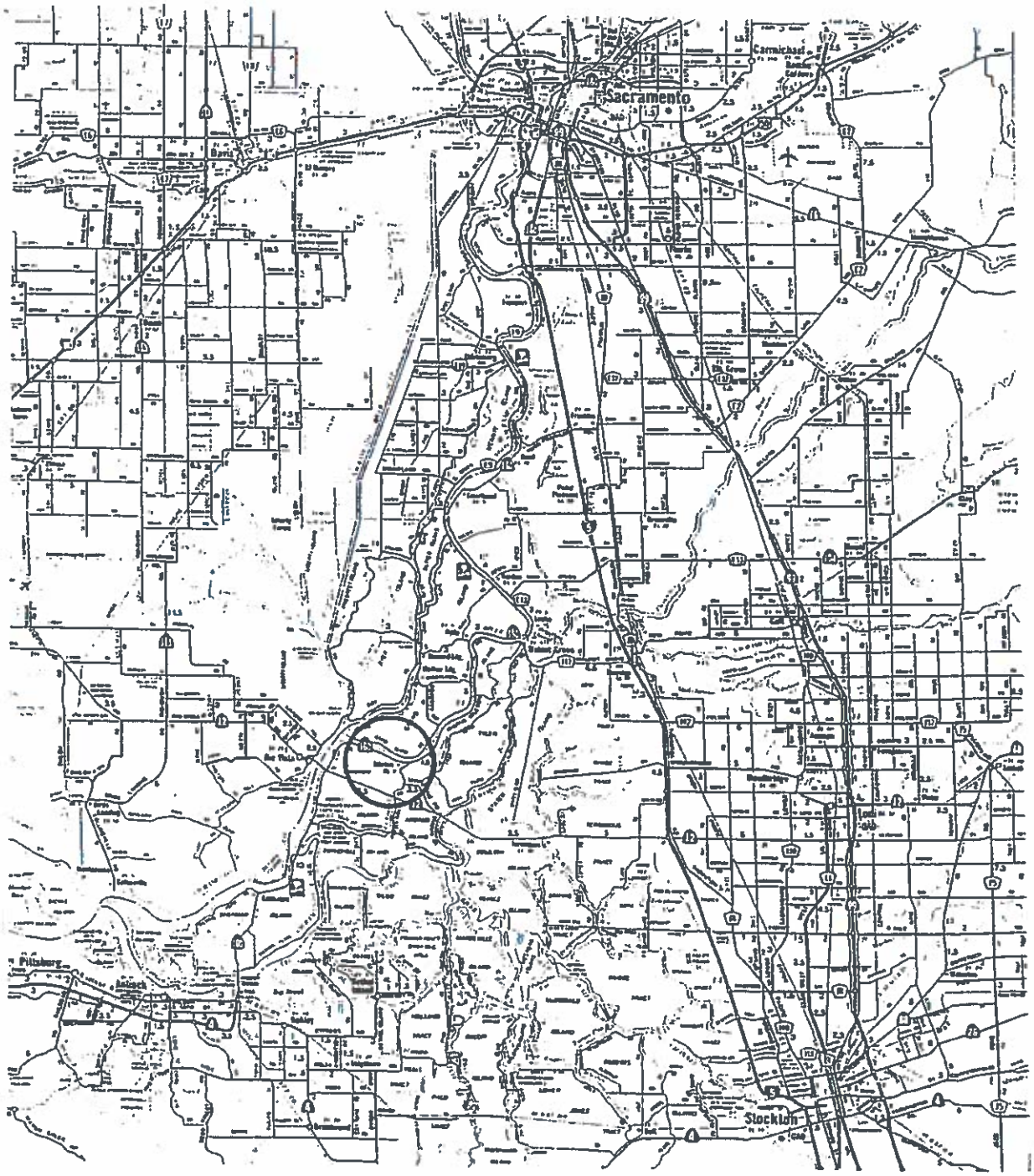


FIGURE III-2

ISLETON PLANNING AREA

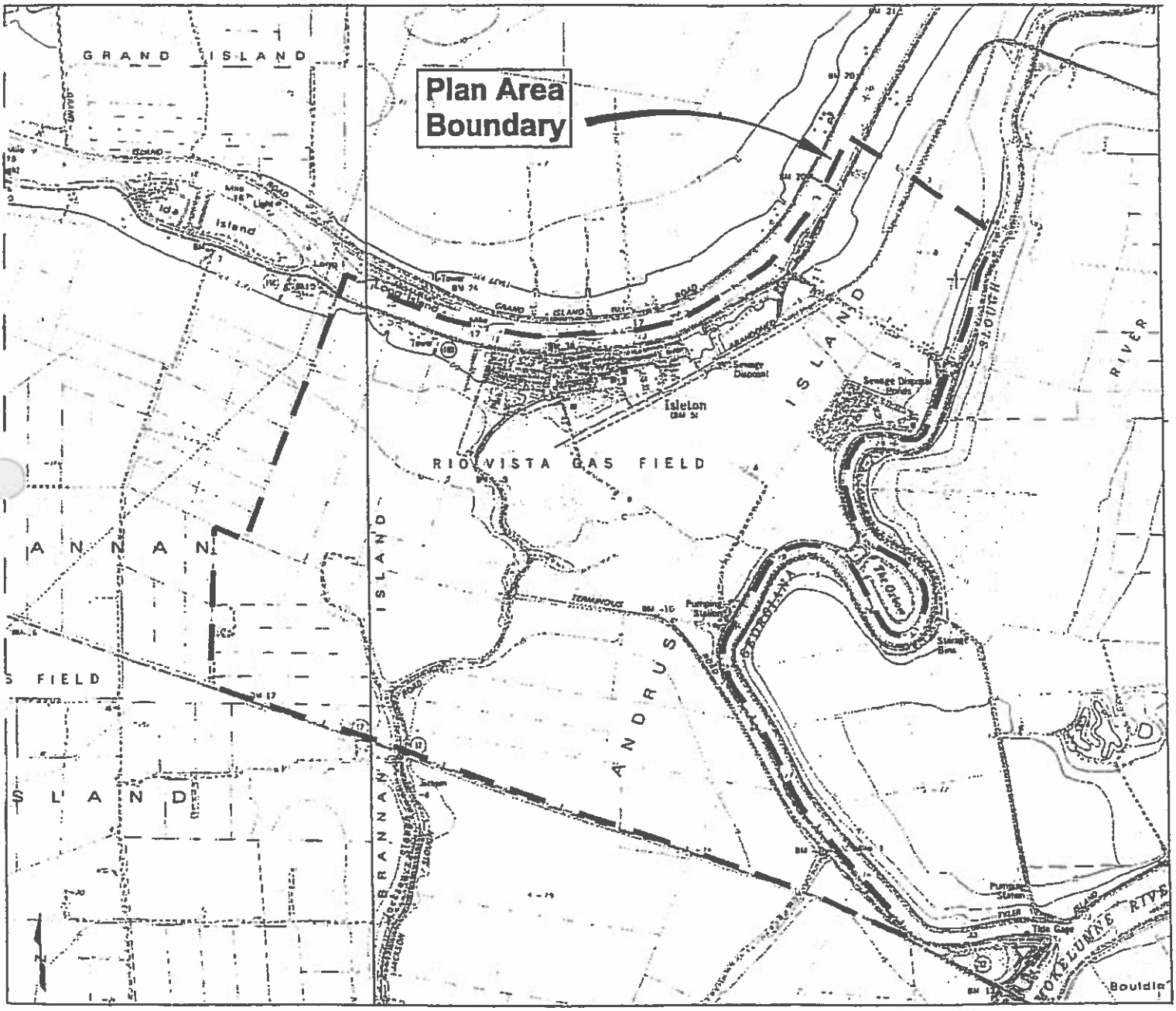


TABLE III-1

STATISTICAL SUMMARY OF EXISTING LAND USE

[within city limits]

1.	Gross Acreage:		=	235.0[1]	100.0%
2.	Developed Land Use (including streets):		=	108.6	46.2
	a. Single-family	= 27.9			
	b. Multi-family	= 2.3			
	c. Mobile homes	= 2.3			
	d. Retail/office comm.	= 7.5			
	e. Service commercial	= 11.7			
	f. Industrial	= 1.4			
	g. Parks & open space	= 11.9			
	h. Public & quasi-public	= 3.7			
	i. Schools	= 8.9			
	j. Streets	= 31.0			
3.	River surface		=	36.0	15.3
4.	Agriculture		=	26.9	11.5
5.	Vacant land within the City		=	63.5	27.0

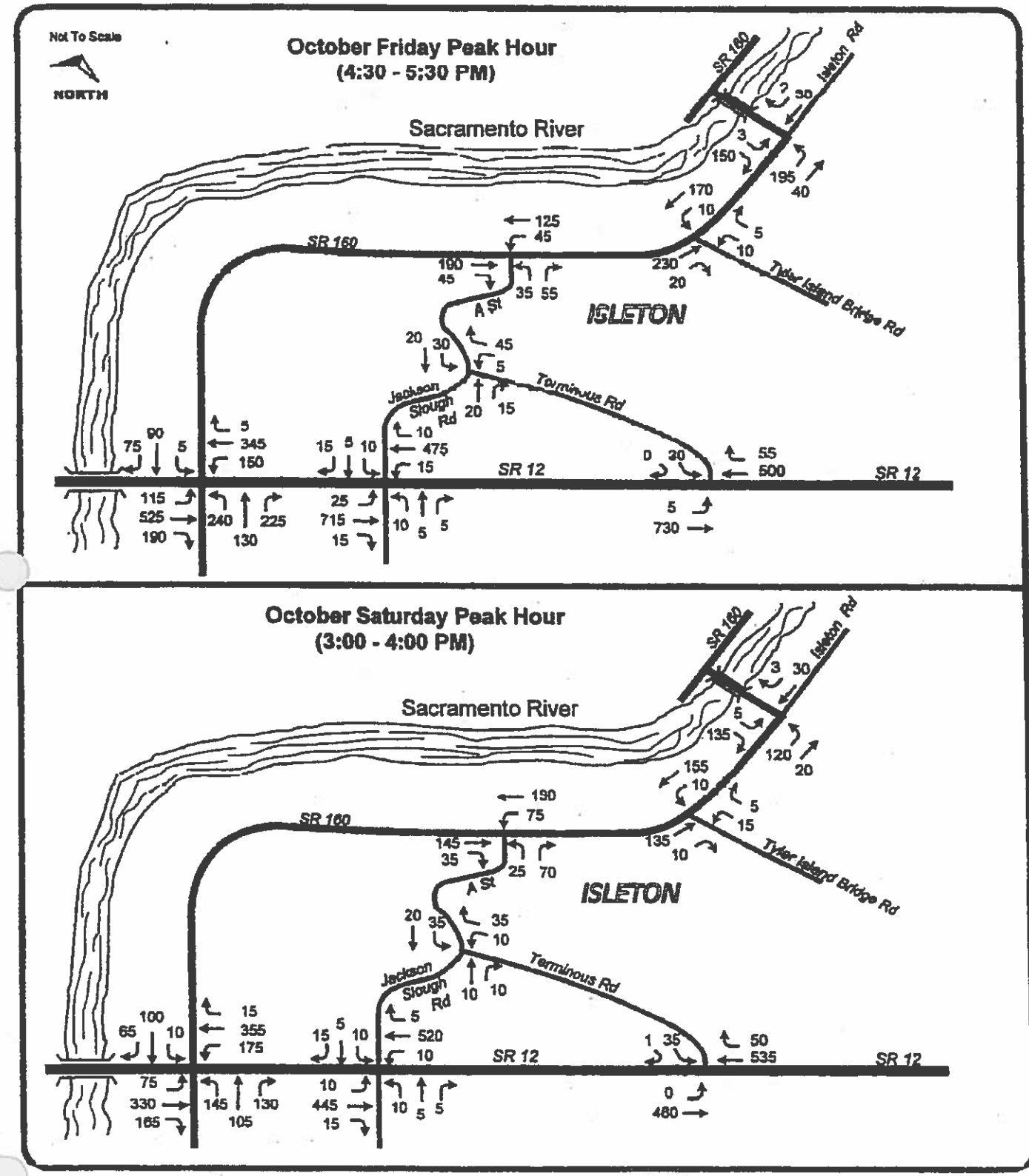
Traffic counts at selected intersections for Friday and Saturday peak hour conditions in October and for the Summer months are shown on Figures III-3 and III-4, respectively. Peak hour traffic for Fridays occurs between 4:30 to 5:30 PM. For Saturdays, the peak hour occurs between 3:00 and 4:00 PM. The higher peak hour traffic volumes occurring in Summer reflect vacation and tourist traffic along the Sacramento River, but excludes special events such as the Crawdad Festival. Peak hour traffic represents approximately 10% of Average Daily Traffic (ADT) over a 24 hour period. For example, from Figure III-1, Friday ADT eastbound at the intersection of State Route 160 and A Street is about 1,900 vehicles. The greatest ADT in the community occurs on Friday immediately west of the Route 160/Tyler Island Bridge Road intersection with about 2,500 cars per day.

Based on traffic counts re and field observations conducted by consultant field crews, traffic conditions on city streets and rural roads in the vicinity indicate acceptable levels of service (LOS) at all but one intersection. Within the City, LOS A and B occurs at the intersections of Route 160 with A Street, Main Street, Tyler Island Bridge Road and Isleton Road. LOS at rural intersections are also acceptable, except for left-turn movements from Terminous Road eastbound onto State Route 12 (los e). Except during occasional peak hours of the year when seasonal tourist events are in progress, traffic volumes along arterial and collector streets of the City are well within the capacity of existing roadways. Along arterial and collector streets, traffic problems occur mostly as the result of intersection design where sight distance is limited. Examples of such intersections are Route 160 and H Street, Route 160 and Main Street and Route 160/Second Street/A Street. Traffic circulation within the City is best served by such east-west streets as Route 160, Main Street,

[1] Includes area in streets.

FIGURE III-3

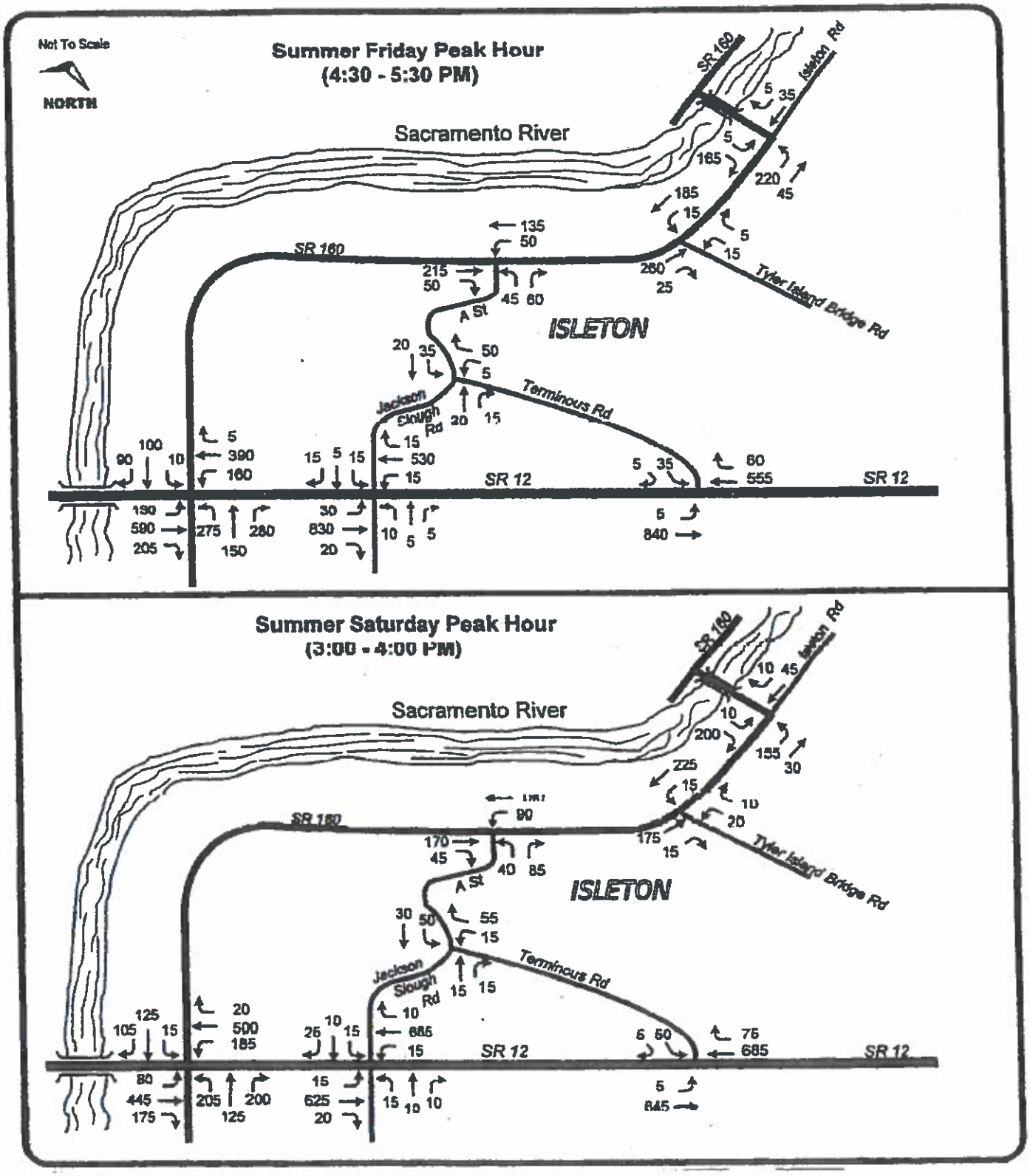
EXISTING OCTOBER FRIDAY AND SATURDAY PEAK HOUR TRAFFIC VOLUMES



Source: Crane Transportation Group

FIGURE III-4

EXISTING SUMMER FRIDAY AND SATURDAY PEAK HOUR TRAFFIC VOLUMES



Source: Crane Transportation Group

Second Street, Jackson Boulevard and Sixth Street. North-south circulation is more limited because of narrow roadways and short blocks.

SOCIO-ECONOMIC CONDITIONS

Existing Population and Households

Data from the State Department of Finance and the Sacramento Area Council of Governments (SACOG) shows that Isleton's population and housing have been stable for the past eight years. Current estimates (January 1999) are 846 people in 329 households and 353 housing units. Of the total housing units, 236 are single-family, 54 are 2-4 units, 17 involve 5 or more units and 46 units are mobile homes. The population of the planning area shown on Figure III-2 is estimated at about 1,300, including the large-lot housing along Tyler Island Bridge Road, the Oxbow Marina and scattered housing throughout the agricultural parcels around the City.

Isleton is part of the SACOG's Delta Regional Analysis District (RAD) which extends in a narrow band along the Sacramento River from Sherman Island at the southwestern tip of Sacramento County northerly to near Clarksburg. The Delta RAD has a population of 5,650 and has grown by 3% since 1970. The Delta RAD is divided into three sections. The I-5 Section (west of I-5 and north of Twin Cities Road)has about 600 people; the Walnut Grove Section has about 2,400 people; and the Isleton Section has about 2,650 people. Most of the growth since 1970, however, has occurred in the Walnut Grove Section -- 116 as compared to 36 in the Isleton Section and 8 in the I-5 Section.

Major cities in the region around Isleton -- Rio Vista, Lodi, Fairfield, Sacramento and Antioch -- have all achieved significant growth in the last seven years as reported by the State Department of Finance and as shown in Table III-2.

TABLE III-2

POPULATION GROWTH OF CITIES IN THE REGION, 1990-1997

City	1997 Population	% Change, 1990-1997
Isleton	835	0 %
Rio Vista	3,700	12 %
Lodi	54,800	6 %
Fairfield	88,000	12 %
Sacramento	380,000	5 %
Antioch	76,000	23 %

Economic Characteristics

Total employment in 1995 for Isleton and its traffic zone was estimated by SACOG at 467 jobs, which includes the number of Isleton residents who are employed outside of Isleton. For the Delta

RAD, the number of jobs has remained quite stable, increasing by only 1%, from 1,781 to 1,805 for the period 1990-1995. By comparison, the increase for Sacramento County was 7% for the same period. While total employment for the Delta RAD has been stable, retail employment had increased by 5% and manufacturing had decreased by 30%. For the County during this period, retail employment increased by 12%, office increased by 8% and manufacturing increased by 4%. The number of 1995 jobs per housing unit in Isleton was 1.16, which is above the County average of 1.11. The ratio is below average in the larger Isleton Area (0.51) and the Delta RAD (0.77).

Isleton's taxable retail sales (excluding food, pharmaceuticals and other selected items) declined from $8.4 million in 1990 to a low of $5.2 million in 1995 -- a decline of 38%. In 1996 (latest published data), taxable sales rebounded to $6.7 million. The number of retail outlets (stores) declined from a high of 30 in 1992 to 24 in 1996. Taxable sales of all other outlets, such as businesses, personal services, wholesale. etc., declined from $2.6 million in 1990 to about $925,000 in 1995 and 1996 -- a decline of 65%. The number of outlets declined by nearly half, from 51 to 27 during the same period.

Comparative data for Isleton, Sacramento County and the State shows that while retail sales were declining in Isleton, they were increasing by 10% for the County and by 13% for the State. In comparing the number of outlets, they increased by 19% for the County.[2] For non-retail outlets, the number for the County grew by 6% along with a 25% growth in taxable sales.

SACOG (Sacramento Council of Governments) estimates that median household income within the Isleton traffic zone in 1999 will be $34,100. The median for the surrounding area ranges from $24,000 to $36,000. The overall average for the Isleton area is $30,000. The average for the Delta Regional Analysis District is $27,200. Federal estimates of personal income show a 24% increase in Sacramento County for the period 1990-1995, as compared to an increase of 19% for the same period in all of California.

1990 Isleton Population and Housing Characteristics

Data from the 1990 Census of Population and Housing can be summarized as follows:

Age: The average age was 36 years, which was about three years below the 38.9 age for the Delta Census Division but 4-5 years above the average age for Sacramento County and the State, respectively. In general, Isleton and the rest of he Delta have higher proportions of people 45 and older, while having substantially fewer people in the 18 to 44 age group.

Gender: Isleton had a 50%-50% split between men and women, whereas the County had a slightly higher percentage of women.

Race: Isleton's population was 77% white, 12% asian, 7% hispanic, 3% indigenous (native) and 1% black. Comparable figures for the Delta Census Division were 80%, 9%, 8%, 1% and 1% . Comparable figures for the County were 75%, 9%, 5%, 1% and 9%.

Households: Isleton had 328 households in 1990, with about half as husband-wife households. It has an above average share (13%) of female headed households. Nearly 25% of all households

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[2] State Board of Equalization, **Annual Taxable Sales Reports for Cities, Counties and the State, 1990-1995.**

consist of persons living alone, about half of which are over 65 years of age. The City's pattern of household types was similar to that of the County. The remainder of the Delta Census Division has a higher share of husband-wife households and a lower share of women-headed households.

Housing Units: Two-thirds of the City's houses were single-family dwellings, 16% are in buildings with 2-4 units, , 4% were in apartments of five or more units and 14% were mobile homes. In the Delta Census Division, 59% were single-family and 33% were mobile homes. The number of apartments in the County and the State were much higher (21% and 23%, respectively. The vacancy rate in the City was about 7% as compared to 11% for the Delta division as a whole. About two-thirds of the housing was owner-occupied, and one-third was renter-occupied.

Owner-Occupied Housing Values: The average value of owner-occupied housing in Isleton was $84,000 as compared to $98,000 for the Delta division, $130,999 for the County and $200,000 for the entire State.

Renter-Occupied Housing Monthly Rents: The average monthly rental in Isleton was $340 as compared to $334 for the Delta division, $460 for Sacramento County and about $560 for the entire State.

PUBLIC SERVICES

Public services of importance to the purposes of the General Plan include the domestic water, sewerage and drainage systems, solid waste disposal, law enforcement, fire protection, parks and recreation and schools.

Sewerage Service

Sewage collection, treatment and disposal is provided by the City of Isleton. The City's sewage treatment plant was replaced in 1976 following the flood which damaged the old plant in 1972. Consisting of engineered evaporation/percolation ponds located along Georgiana Slough southeast of the City, the facility provides only a primary level of treatment. The capacity of the plant exceeds the needs of the current population and there is no need for seasonal discharge. However, while the existing plant has a theoretical capacity to meet the needs of about 2,500 people, it cannot be expanded untill the collection system is rehabilitated. Any significant expansion would require a secondary level of treatment, with land discharge to areas approved by the Central Valley Regional Water Quality Control Board.

The theoretical capacity of the existing plant does not take into account the severe reduction in treatment capacity that can result from infiltration of water into the collection pipe system during wet seasons of the year. Overloading of system capacity occurs primarily because of infiltration of groundwater, runoff from roofs, surface drainage flows and manhole seepage and infiltration. During periods of heavy rainfall, sewage flow reaching the treatment plant flow meter can exceed available treatment capacity, resulting in a temporary overspill by untreated sewage effluent at the treatment ponds. The difference in daily flow between dry weather and wet weather can be significant. Normal daily flow during dry weather is expected to be 0.90 MGD (million gallons per day). This limitation has resulted in a moratorium on new sewage connections, which essentially has become a moratorium on urban growth until capacities for collection, treatment and disposal are

increased. The moratorium was imposed under a Cease and Desist Order issued by the Regional Water Quality Control Board, Central Valley Region.

A smoke test of the sewage collection system conducted in the mid-1990's indicated that excessive infiltration flow into the collection pipelines is probable. Assuming a tight collection system, the maximum dry weather or wet weather flow from a population of 850, along with limited wet industry and food service, would be about 0.900 MGD. In addition to rehabilitation of the collection system, some improvement to the treatment plant will also be required. The Regional Water Quality Control Board has reserved $2.70 million in Grant funding for rehabilitation of the system with little if any money reserved for capacity needed to serve future development. A Project Report addressing the City's current needs has been prepared by the City Engineer to support grant fund applications by the City to the Regional Board and to the US Department of Agriculture. Rural Development Department. The City's portion of total costs would be augmented by the use of redevelopment funds and CDBG funds .

Water Supply

Domestic water is supplied to the City by the Citizens Utilities Company, a private water company. The water system consists of three wells, pumps, water treatment equipment, water storage, distribution piping, fire hydrants, valves and other equipment. The third well was added to the system in late 1997, drawing on a deeper aquifer and better quality groundwater than is available from the other two wells. Operation and maintenance of the system is performed by staff of Citizens Utilities. In addition to the new well, recent improvements to the water system include a new overhead storage tank with a 100,000 gallon capacity and new piping. Some replacement of 4" pipe with 6" pipe has been completed to supply water to hydrants at pressures and quantities needed to meet insurance underwriter requirements for fire flows.

Monthly rates for water service are based on rates set for the Sacramento Region by the State Public Utilities Commission. Rates are charged by Citizens Utilities to Isleton users, based on the actual metered amount of water used each month.. The Commission also approves the maintenance program followed by Citizens Utilities for Isleton. At this time (July, 1999), an adequate supply of safe drinking water is available for the City's needs. However, the distribution system needs improvement.

Surface Drainage

Assuming that excess surface drainage flows into the sewage collection system is controlled through rehabilitation of the existing sewage collection system, the management of surface water drainage should be addressed so that yards, gutters and street sections are not flooded. Much of the City street system has curb, gutter and some drop inlets installed with ultimate disposal to ditches south of town. Where curb, gutter and drop inlets are missing, drainage occurs by gravity flow to the lowest points along the street system and adjacent parcels.

Flooding and Flood Control

The City of Isleton is located at the north end of Andrus Island, with an elevation of only five feet (5') below mean sea level at its highest point located at the base of the levee along the Sacramento

River. The Sacramento River levee is a Project Levee of the U.S. Army Corps of Engineers, with a height of about 18' above mean sea level. The community is underlain by as much as 10' of organic peat soils, increasing to more than 40' at the southern end of Andrus Island.

Andrus and Brannan Islands are protected by about 19.2 miles of Federal Project levees and about 6.2 miles of non-project levees. Project levees were constricted or enlarged as part of Federal flood control projects and the Sacramento River deep water ship channel project. These levees are maintained to Federal standards by the State of California directly, or by contract under State supervision. Non-project levees are either private levees (i.e., privately constructed, owned and maintained) or direct-agreement levees repaired or restored by the Corps of Engineers following major floods and maintained by agreement with the Federal Government.

Much of the levee system protecting Isleton prior to 1982 had insufficient freeboard to provide adequate protection against high tides which was aggravated by poor foundation conditions involving consolidation and subsidence of the peat soils which underlied much of the levee system. . In an EIS (environmental impact statement) prepared in 1982, the Corps estimated the probability of levee failure through instability or overtopping of levees to be approximately 4%.[3] Since 1982, however, the levee system has been significantly improved, meeting the HMP one-foot freeboard standard in 1991, and now approaching achievement of the Corps one and one-half foot standard established under Public Law 84-99. Other significant improvements include the installation of rench drains to better hanle seepage problems and stability berms have been constructed in critical areas.

The flooding of Andrus-Brannan Island in 1972 serves as an example of the seriousness of flooding potential for Isleton. A breach occurred along a section of levee that was being rehabilitated to control seepage and provide additional freeboard and crown width for better flood protection. A temporary levee constructed to protect Isleton was overtopped by the flood waters before the levee could be completed. As a result, nearly half of the City was inundated, including the sewage treatment facilities, and the health risk posed triggered the evacuation of the town's residents. The breach was closed about five weeks after it occurred; residents were allowed to return in seven weeks; and, all auxiliary pumping was completed in about 15 weeks. Total damage was estimated by the Corps at $97 million (measured in 1981 dollars).

The entire City of Isleton lies within a 100 year flood zone, involving different standards for floor level elevation for residential, rehabilitated residential and industrial construction. The most recent housing construction typically has involved two stories, with garages at ground level and living quarters on the second story above the 100 year intensity flood level.

Solid Waste Disposal Service

Solid waste disposal is provided by the Camarillo Sanitation Service, a private company, under contract with the City of Isleton. Solid waste is transported to the Delta transfer station near Isleton from where it is trucked to the County's 656 acre sanitary landfill at Kiefer Blvd. and Grantline Road southeast of Sacramento. The County's landfill site has an expected useful life to the year 2040.

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[3] U.S. Army Corps of Engineers, Sacramento District, **Sacramento-San Joaquin Investigation California, Draft Feasibility Report and Draft Environmental Impact Statement for Water Resources Development**, October 1982, pp 52-56.

Police Protection Services

The Isleton Police Department currently has three full-time sworn officers, and the Department operates three police cars for community patrol from offices located in City Hall.

Fire Protection Services

Fire protection services are provided by the Isleton Fire Protection District. District boundaries extend approximately 2-1/2 miles from the City limits , encompassing an area of approximately 27 square miles. The District operates seven fire trucks and the City owns two of its own. District and City facilities are located on Jackson Boulevard and at the intersection of Jackson Boulevard and Second Street. The District has one ambulance and fireboat, and has one full-time employee and 27 volunteer firemen.

Parks and Recreation

The community's parks are located along the south side of Main Street within the Main Street commercial center, and at the south end of Andrus Circle at the westerly edge of town. The latter facility includes a ballpark and a landscaped area for passive recreation pursuits. Additional recreation areas and facilities are provided at the school site, as described below.

School Services

Isleton is served by the River Delta Unified School District. School facilities within Isleton provide primary education for grades K-8. Secondary education for Isleton students is provided at the Rio Vista High School. The elementary school program is provided at classroom and other facilities on either side of "D" Street south of Union Street in the center -art of town. Grades K-3 are housed east of "D" Street, while grades 4-8 occupy the block bounded by Union, Fifth, C and D Streets. The school site includes about 4.0 acres developed for recreation use by school children. Facilities for recreation include areas for court games.

The capacity of existing facilities is estimated by the District at about twice the current enrollment of 200 students. While the school serves families residing outside of Isleton, the only real potential for increasing enrollment would be growth within the existing city limits of Isleton and growth that may be encouraged within the larger planning area shown on Figure III-2. Because growth of the school child population has been so nominal over the years, the District does not impose school impact fees upon new housing or commercial development. The aging of the population discussed previously, coupled with little residential growth, has kept total enrollment fairly stable since 1980.

Community Facilities

A branch library of the Sacramento City-County library system is located in a building, along with the US Post Office, at the southeast corner of 2nd and D Streets. A community center was completed in the late 1970's along the west side of Jackson Blvd. south of the Fire Station and old City Hall complex. After sustaining earthquake damage so severe in 1989 that it could no longer house City functions, the old City Hall at the corner of 2nd Street and Jackson Boulevard was condemned and subsequently razed. City Hall functions are currently housed on the former park site on Second

Street ,west of Jackson Boulevard. The Community Center provides for a variety of civic meetings throughout the year, as well as accommodating regular and special meetings of the City Planning Commission and City Council.

LAND RESOURCES

Agricultural Lands

Land resources surrounding the Isleton urban area have been devoted to the diversified production of field crops, vegetables and some deciduous fruits. Most of the acreage within the planning area shown on Figure III-2 is designated by the State's Farmland Mapping Program as Prime Farmland. And, most of that acreage has also been placed under Williamson Act contract. If any of this acreage is to be encouraged for urbanization by the Isleton General Plan, release from Williamson Act contracts will be required. Lands under Williamson Act contract are taxed based on their agricultural, productivity and not on their speculative or non-agricultural values in the open land market. In order to provide reasonable assurance that the State's goals of preserving agricultural lands would succeed, State Law makes it somewhat time consuming and difficult to cancel a contract. Two methods are provided to void the practical effects of a Williamson Act contract. The first is to have the owner initiate a "Notice of Non-Renewal" which starts a process of automatic cancellation 10 years after the anniversary date of the contract which follows the date when the Notice is filed. The second method is to seek a "cancellation" of the contract either by the County, or by the City if the property is annexed to the City. In either case,, one of two findings prescribed by law have to be made involving findings of "Consistency" with the Williamson Act or that the cancellation is in the "Public Interest".

Soils of the planning area are Delta peat, ranging from 10' to as much as 40' in depth. These soils have undergone varying degrees of subsidence over the years and subsidence continues as the result of exposure (oxidation) of peat soils to the drying factors of air and subsequent shrinkage and wind erosion. Such subsidence is typical throughout the Delta. These naturally occurring conditions require special engineering evaluation for determining appropriate foundation design for structures.

Seismicity involves the distribution, recurrence and intensity of earthquakes over a period of time in a given region. Earthquakes most often result from the release of stored energy from subterranean rock formations which may be found miles below the earth's surface. Such a release can cause the rupture of brittle earth materials. The rupture surface along which earth is displaced is called a "fault". A fault line is the visual or physical manifestation of the displacement which takes place on either side of the rupture surface.

The amount of energy released at the epicenter of an earthquake is measured and recorded by sensitive devices, and the magnitude registered is expressed by the so-called Richter (Magnitude) Scale. This scale is logarithmic in that each successively higher Richter magnitude reflects an increase of nearly 31.5 times in the amount of energy released. As an example, the energy released by a Richter scale of 8.0 is approximately 1,000 times greater than that released by a magnitude of 6.0. In terms of ground motion, each successive increase in Richter magnitude reflects about a tenfold increase in ground motion associated with an earthquake.

FIGURE III-5

REGIONAL FAULTS OF NORTH-CENTRAL CALIFORNIA

The seismicity of the Isleton area is primarily related to the San Andreas Fault system. Major faults of this system within the region are shown on Figure III-5 in relation to Isleton. The Midland and Tracy-Stockton faults are highlighted on Figure III-5 only because of their close proximity to Isleton. Geologists consider these fault to be inactive for lack of geomorphic evidence of recent faulting. A blind-thrust fault (not shown on Figure III-5) also exists in close proximity to Isleton which trends southward toward Vacaville and Winters that caused the Winters-Vacaville earthquake of December 1892. From Table III-3, the San Andreas, Hayward, Calaveras and Green Valley-Concord faults have the greatest potential. For comparison, the Loma Prieta earthquake near Watsonville that occurred in October, 1989 was felt in the Isleton area with a magnitude of approximately 6.0, and in the City of San Francisco at near 7.0. This quake did hundreds of $ millions damage within Santa Cruz County and the southern half of the San Francisco Bay Region, and with loss of life. The damages caused by this quake have yet to be fully repaired. Isleton's City Hall was seriously damaged by the Loma-Prieta Quake to the point where total replacement is required.

For the Isleton planning area, with all of its land areas below levees which surround it, foundation engineering becomes critical to avoiding the damage that can occur from earthquake-induced levee and soil failures due to the decomposition and liquefaction of soils.

TABLE III-3

MAJOR FAULTS AFFECTING THE ISLETON PLANNING AREA[4]

FAULT	Approximate Distance from Isleton (Miles)	Maximum Credible Earthquake*	Maximum Probable Earthquake**
San Andreas	60	8.25-8.5	7.8-8.25
Hayward	42	7.0-7.5	7.25
Calaveras	38	6.75-7.3	6.75
Concord-Green Valley	36	6.5-7.25	6.7
Antioch	22	5.75-6.6	6.6
Greenville	35	6.9	6.8
Ortigalita	47	6.7	6.7
Midway	26	6.3	6.3
Midland	3	7.0	–

* Maximum credible earthquake (Richter scale) is the maximum earthquake that might reasonably occur under conditions presently known.

** Maximum probable earthquake is the maximum earthquake that can reasonably be expected within the next 100 year period.

Note: The midland fault close to Isleton is concealed by alluvium is considered inactive but possibly capable of generating a near 7.0 earthquake. The Loma Prieta earthquake on the San Andreas Fault in the Santa Cruz mountains in October 1989 seriously damaged Isleton's old city hall because of its unreinforced masonry construction.

[4] Calif. Division of Mines & Geology, 1975

WATER RESOURCES

Groundwater in the Isleton planning area is of generally good quality and plentiful, but groundwater levels are high during all seasons of the year. The high water table poses a problem for the disposal of treated sewage effluent to the land under any conditions where disposal ponds would have to be enlarged significantly to accommodate substantial urban expansion.

The location of the community along the Sacramento River and in proximity to Georgiana Slough has enhanced the physical character of the community. Until recently, the Sacramento River resources had not been utilized to the best advantage of the community. Plans now underway by the City will soon transform the river frontage into a landscaped corridor which will offer passive recreation pursuits, a levee walkway, boat access and bank fishing.

CLIMATE AND AIR QUALITY

While the climate of Isleton and of Sacramento County is semi-arid, it is not typical of most of the Sacramento Valley where summer temperatures are known to exceed 100 degrees F. for more a week at a time. The Isleton area is heavily influenced seasonally by marine breezes which flow through the Carquinez Strait and generally follow the course of the Sacramento River in the Delta. Average annual rainfall varies considerably, from less than 7" during dry years to over 20 " during wet years.

Air quality does not presently meet state or federal standards for ozone for the local air basin for several days during the period May through October. Sacramento County is also not in attainment for standards of fine particulate as adopted by EPA. California's one-hour ozone standard is 0.09 ppm (parts per million, by volume), not to be equaled or exceeded. The Federal standard for ozone is 0.12 ppm, not to be exceeded more than three times in any three year period. Ozone standards now are typically exceeded several times per year at most monitoring stations. CO (Carbon Monoxide) standards are not typically violated in the Isleton area at any time of the year. To a significant extent, local air quality is adversely affected by ozone emissions resulting from inter-regional transfer of pollutants from the San Francisco Bay Area. Standards for particulates small enough to be inhaled and which can cause lung damage (PM_{10}) are violated more frequently than other standards because of the amount of fine peat-based particles that are carried by winds from the Delta to the more urbanized parts of Sacramento County and the Sacramento Valley to the north.

Periods of air pollution are heightened during the fall months when the temperature inversion common to the Sacramento Valley traps pollutants within a warm air mass below a layer of cool air. In the winter, this inversion pattern reverses, trapping cool air below the warm air mass and creating conditions favorable to frequent heavy fog conditions. The seasonal periods of heavy fog are particularly impacting on the Isleton area and the State Route 12 corridor between Lodi and Fairfield, with the heaviest occurrences during the months of December and January.

Regulations Governing Air Pollutants

Criteria Pollutants. The 1970 Clean Air Act gave the U.S. Environmental Protection Agency (EPA) the authority to set federal ambient air quality standards to protect public health and welfare. It also required that these federal standards be designed to protect people most susceptible to respiratory

distress, such as asthmatics, the elderly, very young children, people already weakened by illness, and persons engaged in strenuous work or exercise (all termed "sensitive receptors"). Pollutants subject to federal ambient standards are referred to as criteria pollutants because the EPA publishes criteria documents to justify the choice of standards.

Currently, most of the effort to improve air quality in the United States is directed toward the control of five criteria pollutants: photochemical oxidants (ozone), carbon monoxide (CO), suspended particulate matter[5], nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Fifteen years ago, suspended particulate lead would have been included in this list but today the widespread availability and use of unleaded gasoline has effectively eliminated lead as a pollutant of widespread concern.

The Federal and State standards (the latter established in California starting in 1969, pursuant to the Mulford-Carrell Act), shown in Table III-4, are thought to provide sensitive receptors with adequate protection during the given exposure times from the adverse health effects detailed in Table III-5.

The 1977 Clean Air Act Amendments required that each state identify areas within its borders that did not meet federal standards (termed non-attainment areas) and devise a State Implementation Plan (SIP), subject to EPA approval, which would guarantee attainment no later than the end of 1987. The Clean Air Act Amendments did not specify what course of action should be undertaken by the EPA if states failed to meet the 1987 attainment deadline. Many states did not meet the 1987 deadline and continue to experience violations of federal air quality standards. After 1987, the EPA could have imposed sanctions in non-attainment areas (e.g., prohibiting the construction of major air pollution sources, withholding federal funds for transportation and sewage treatment projects, etc.), but chose to wait for Congress to amend the Clean Air Act.

The 1990 Clean Air Act Amendments represent a major revision of the original statute. They specify new strategies for attaining federal air quality standards including: mandatory 3% annual reductions of air pollutant emissions in areas exceeding federal standards, the requirement that new stationary sources of air pollutants must more than offset their emissions (1.2 tons of offsets for every ton of pollutant emitted), the scheduled introduction of low-emitting cars and trucks into the motor vehicle fleet, and the development of alternatives to the private automobile as the primary means of transportation.

The 1988 California Clean Air Act will require an even more vigorous parallel effort toward attainment of State air quality standards, which in many cases (e.g., ozone) are more strict than the federal standards. It mandates air pollutant reductions amounting to 5% annually in areas exceeding State standards, permits no net increase in pollutant emissions from any new stationary source regardless of how small it is, requires significant replacement of conventional gasoline-powered automobiles over the next 20 years by models running on cleaner fuels, and promotes mass transit and car pooling as strategies to reduce pollutant emissions.

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[5] The standard for particulate matter was originally applied to particulates of any diameter, termed "total suspended particulates" or TSP. The standard has been changed recently to apply only to particulates less than 10 microns in diameter, termed PM_{10}.

TABLE III-4

FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	Averaging Time	Federal Primary Standard	Federal Secondary Standard	California Standard
Ozone	1-hour	0.12 ppm[6]	0.122 ppm	0.09 ppm
Carbon Monoxide	1-hour 8-hour	35.0 ppm 9.0 ppm	35.0 ppm 9.0 ppm	20.0 ppm 9.0 ppm
Nitrogen Dioxide	1-hour Annual	— 0.05 ppm	— 0.05 ppm	0.25 ppm —
Sulfur Dioxide	1-hour 24-hour Annual	— 0.14 ppm 0.03 ppm	— — —	0.5 ppm 0.05 ppm —
Suspended Particulates[7]	24-hour Annual	150 ug/m^3 [8] 50 ug/m^3	— —	50 ug/m^3 30 ug/m^3

[6] ppm – parts per million

[7] State and Federal standards are for particulate material less than 10 microns in diameter.

[8] ug/m^3 – micrograms per cubic meter

TABLE III-5

HEALTH EFFECTS SUMMARY OF THE CRITERIA AIR POLLUTANTS

POLLUTANT	Adverse Effects
Ozone	- eye irritation; - respiratory function impairment
Carbon Monoxide	- impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin - aggravation of cardiovascular disease - impairment of central nervous system function - fatigue, headache, confusion, dizziness - can be fatal in the case of very high concentrations in enclosed places
Sulfur Dioxide	- aggravation of chronic obstructive lung disease - increased risk of acute and chronic respiratory illness
Nitrogen Oxide	- risk of acute and chronic respiratory disease
Suspended Particulates	- increased risk of chronic respiratory disease with long exposure - altered lung function in children - with SO_2, may produce acute illness - particulate matter 10 microns or less in size may lodge in and/or irritate the lungs

Toxic Air Pollutants. In addition to the major criteria air pollutants, many other substances are known or suspected to be highly injurious to human health. Their adverse health effects can manifest themselves either as acute, debilitating symptoms after a short-term heavy dose or by the development of various cancers after long-term low-level exposure. The EPA has established a list of over 400 "extremely hazardous" substances and has promulgated emission standards (known as National Emissions Standards for Hazardous Air Pollutants or NESHAPS) for nine of these compounds (i.e., arsenic, asbestos, benzene, beryllium, cadmium, coke oven emissions, mercury, radionuclides, and vinyl chloride). California has designated several substances as "toxic air contaminants" (i.e., asbestos, benzene, cadmium, chromium, dioxin, ethylene dichloride, and ethylene dibromide) and is reviewing about 40 others under the process established by AB 1807 (Tanner).

Although no federal or State ambient air quality standards have been set for toxic air pollutants, a recently passed State law, AB 2588, the Air Toxics "Hot Spot" Information and Assessment Act of 1987, requires the gathering of information on airborne compounds that may pose an acute or chronic threat to public health. The Act specifies that each local Air Pollution Control District determine which facilities must prepare a health risk assessment. This assessment must include a comprehensive analysis of the dispersion of hazardous substances in the environment, the potential

for human exposure, and a quantitative assessment of both individual and population-wide health risks associated with those levels of exposure.

Regional and Local Air Quality Problems

Regional. Ozone is the most severe air quality problem in the State. Unlike many other air pollutants, ozone is not emitted directly into the atmosphere, but is produced therein by sunlight-enhanced reactions between hydrocarbons (HC) and nitrogen oxides (NO_x). Large areas of California's Central Valley suffer from high ozone levels. Population, industrial, and agricultural centers there emit ozone precursors in great quantities and dispersion is limited by surrounding mountain ranges and strong summertime temperature inversions.

Carbon monoxide (CO) is a non-reactive pollutant with one major source, motor vehicles. Thus, ambient CO distributions closely follow the spatial and temporal distributions of vehicular traffic. CO levels are highest in the State's urban areas during the winter months, when nocturnal temperature inversions limit dispersion during peak commute hours. Interior areas are more susceptible to the formation of winter inversions than coastal areas. CO standard violations are not uncommon in many cities of the Central Valley because of the high concentration of motor vehicle traffic. In contrast, CO levels in rural areas such as Isleton are invariably much lower because traffic volumes are lower.

Problems with suspended particulates are widespread in California. Many rural areas have a high natural particulate background as a result of soil particles carried by the wind. Human activities can add significant amounts of particulates to the air through plowing and the burning of field waste in rural areas, and through fuel combustion and the suspension of dust by motor vehicles and construction equipment in urban areas. Ambient particulate concentrations in the lower Sacramento Valley and Delta are frequently high enough to violate State standards and reduce visibility.

Nitrogen dioxide (NO_2) is the most abundant form of ambient NO_x. The major sources of NO_x, compounds which have an important role in the formation of ozone, are vehicular, residential, and commercial fuel combustion. The NO_2 standard is currently being met throughout the Delta. The refining of high sulfur oil or the burning of high sulfur fuels are the major sources of ambient SO_2. The SO_2 standard is currently being met throughout the State.

Local. Ozone data for Stockton illustrates the degree to which the Delta suffers from ozone. Experience has shown that areas affected by high ozone concentrations are typically many square miles in extent. Therefore, the Isleton planning area should be exposed to nearly the same levels of ozone as recorded in Stockton. Stockton also experiences occasional violations of the eight-hour CO standard. But the problem can be expected to be much less severe in more rural areas such as Isleton.

State PM_{10} standard violations have been recorded in Stockton. Since the Isleton planning area is located in an area which experiences a dry climate, naturally produced particulates sucvh as peat , when added to anthropogenic emissions from nearby cities and roadways, probably contribute to a generally high PM_{10} levels. Pesticides sprayed in agricultural areas in the vicinity of the project also can be considered local sources of air pollution.

State and Local Air Quality Control

The California Air Resources Board (CARB) has ultimate jurisdiction over all air pollution control programs in California. The CARB monitors air quality throughout the State, limits allowable emissions from vehicular sources, and serves as the official liaison with the federal government. The CARB has divided the State into many air basins (i.e., areas which share similar pollutant problems and climatic conditions) and has delegated significant authority for air quality control within them to local Air Pollution Control Districts (APCDs) or multi-county Air Quality Management Districts (AQMDs).

In recognition of the common topographical and meteorological factors which link air quality problems of the lower part of the Sacramento Valley, the countiews of Sacramento, Yolo and parts Placer and Solano Counties have created the Sacramento Air Quality Maintenance Area (SAQMA) which has adopted individual programs to control air pollution. These programs, along with those of the county Air Pollution Control Districts (APCD's), and requirements for restrictions on automobiles by the State Air Resources Board (ARB), formed the Air Quality Plan for the Air Basin as required by the Federal Clean Air Act. The County of Sacramento has adopted an Air Quality Elemeent of the County's General Plan which includes policies covering point and area source controls, mobile source controls, land use controls, and ozone depletion control.

THE NOISE ENVIRONMENT

Noise levels in the Isleton area are relatively quiet and of only occasional irritation. The highest noise levels of 70-75 dB occur in the immediate vicinity of the 2nd Street commercial corridor, primarily due to occasional truck traffic either climbing or descending along levee ramps of State route 160 which provide access to 2nd Street. These levels quickly drop to under 65 dB without truck traffic and below 60dB within residential areas to the south. The saving factor is that truck traffic is intermittent and therefore high sound levels do not become a part of the ambient (background) noise levels in the community. No sensitive receptors are adversely affected by sound levels anywhere in the community.

ENERGY RESOURCES

There are no direct sources of energy within the community except those relatively few privately-owned solar power generating units. All energy sources (other than wood burning stoves and fireplaces and combustion engines) are provided by the Pacific Gas & Electric Company.

ARCHAEOLOGICAL AND CULTURAL RESOURCES

Record searches have not revealed the presence of any archaeological resources within the Isleton planning area, but the corridors along the Sacramento River and Georgiana Slough are considered to be areas of High Sensitivity for the presence of prehistoric cultural resources. Buildings and sites of historic significance in Isleton include the commercial/residential structures along historic Main Street and the Odd Fellows Hall Building at 2nd and A Streets which backs up to the river.

SCENIC RESOURCES

The scenic resources that exist within the planning area are related to the distance from transportation corridors and from areas of open space where the resources can be observed. Views from City streets consist largely of foreground views of housing and commerce which obscure middle ground and background views of farmland to the south, and of the river. Exceptions are provided when driving along levee road sections of State Route 160 which afford views of the river environment, and sections of Jackson Blvd. south of town which provide views of agricultural lands.

Because of its general elevation above adjacent lands, views from the State Route 160 corridor along the Sacramento River provide both a middle ground view of at least part of the existing developed community, and background views of the agricultural areas to the north, south, amd east, and and to the Coast Range of mountains to the west. Views of the Sierra Nevada are more restricted than are views of the Coast Range because of atmospheric conditions. State Route 160 is included in the State's Master Plan of Scenic Highways and has been designated a scennic highway by Caltrans.

BIOLOGICAL RESOURCES[9]

Introduction

The Isleton planning area (see Figure III-2) covers portions of Andrus and Brannan Islands in the Sacramento River Delta. The predominant natural plant communities in the Delta region include Fremont cottonwood and mixed willow riparian woodlands, emergent aquatic communities, and California annual grasslands. Andrus and Brannan Islands are composed of peat. The topography of the planning area is relatively flat. The lowest elevation, approximately 15 feet below sea level, results from the decomposition of the organic deposits and the consequential land subsidence. Artificial levees are the highest land features at approximately 25 feet above sea level.

Most of the planning area is located over a portion of the Rio Vista Gas Field. The planning area is protected from flooding by federal flood control project levees along the Sacramento River and Georgiana Slough and reclamation district levees along Sevenmile Slough and the North Fork of the Mokelumne River.

Literature Review

A comprehensive list of all state- and federally-listed species and species of special concern that occur, or could potentially occur in the planning area was developed from: 1) a review of current lists prepared by the California Department of Fish and Game (DFG) Natural Diversity Data Base identifying special status species; 2) a computerized search of the California Natural Diversity Data Base (CNDDB/ RareFind report, 20 November 1997) for the Isleton quad and February 1998 for the Rio Vista USGS topographic quadrangle; and 3) a letter, dated 28 November 1997, from the U.S. Fish and Wildlife Service, Ecological Services, Sacramento Field Office, summarizing current

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[9] This section was adapted from the **Biological Resources Evaluation for the Isleton General Plan Update and EIR**, Sycamore Environmental Consultants, January 1998.

file data on special-status species that could occur in the project vicinity. The complete list of these species is presented in Table III-6.

Information on the biology, distribution, taxonomy, legal status, and other aspects of the special-status species was obtained from documents on file in the library of Sycamore Environmental Consultants. A literature search was conducted to determine if suitable habitat for special-status fish occurs in the project study area. Sources of information used to evaluate habitat for special-status fish species included McEwan and Jackson (1994), McGinnis (1984), Moyle *et al.*, (1995), and Thelander and Crabtree (1994).

While a certain amount of repetition of data and information is found between this discussion of existing biological resources and the discussion found in the General Plan EIR in Part VIII of this document, the complexity of the topic for the Isleton area justifies the repetitition.

Field Surveys

Site reconnaisance surveys were conducted in November 1997 to determine the planning area's existing plant and wildlife species, the presence or potential occurrence of special-status species, and identify potential wetlands and waters of the U.S. All identifiable plant species observed were recorded and the major plant communities were identified and mapped. A list of plant and wildlife species identified during the reconnaisance surveys is included in Table III-8. Detailed surveys for special-status plant and wildlife species were not conducted.

Vegetation and Habitats

The major plant communities and wildlife habitat types occurring in the planning area include agricultural fields, orchard, riparian, riverine, ruderal, and urban habitats. Table III-6 presents the acres of major habitat types occurring within the area.

TABLE III-6

ACREAGE OF MAJOR HABITAT TYPES

Major Habitat Types	Acres
Agricultural fields	2,495
Orchard	16
Riparian	15
Riverine	89
Urban	374
Total	2,989

Agricultural land:

The primary land use in the planning area is agriculture, involving mostly row crop production, covering approximately 2,495 acres. An additional 16 acres of agricultural land is a pear orchard located adjacent to the Sacramento River and west of the City of Isleton.

Riparian:

Riparian woodland vegetation accounts for approximately 15 acres. The riparian woodland occurs mostly in narrow corridors along the Sacramento River and Georgiana Slough. The riparian corridor is dominated by >Fremont cottonwood, willow, and California sycamore, with Valley oak and Northern California black walnut interspersed in the riparian corridor. Jackson Slough, a minor slough which defines the Andrus/ Brannan Island boundary, is dominated by willow and emergent vegetation such as cattail. Smith Slough, a minor slough on Brannan Island that connects to Jackson Slough on the north side of Highway 12, is vegetated with emergent plants such as cattail.

The riparian corridors provide nesting and foraging habitat for a wide variety of avian species. Bird species observed include American crow, Black phoebe, Black-shouldered kite, Bushtit, Dark-eyed junco, House finch, Nuttall's woodpecker, Red-tailed hawk, Scrub jay, and Yellow-billed magpie.

Riverine:

Approximately 89 acres of riverine habitat occur in the planning area. Riverine habitat includes the Sacramento River and Georgiana Slough. Georgiana Slough branches off the Sacramento River immediately downstream of Walnut Grove and empties into the Mokelumne River south of the planning area downstream of where the North Fork and South Fork of the Mokelumne merge. Jackson Slough serves as an agricultural drainage canal within the planning area and is primarily an emergent habitat. Jackson Slough drains into Sevenmile Slough via pumps.

The Sacramento River Delta is an important fisheries area. It supports a large population of native freshwater fish (Sacramento perch, Sacramento roach, River lamprey, etc.) as well as special-status fish such as the Delta smelt, Longfin smelt, Sacramento splittail, Chinook salmon, and Green sturgeon. The Delta is a migration corridor for anadromous fish (salmon, trout, sturgeon, etc.) to and from their spawning grounds. Non-native fish such as Striped bass, Large-mouth bass, Channel catfish, Mosquitofish, Yellowfin goby, and Carp occur in the Delta, introduced as either intentional or non-intentional releases into California waters.

The aquatic environment in the seasonally submerged zone immediately adjacent to natural river banks is an important fisheries habitat. Shaded Riverine Aquatic (SRA) cover is a term used by USFWS (U.S. Fish and Wildlife Service)to refer to the unique habitat formed at the edge of a river where there is woody riparian vegetation on the river banks (USFWS, 1992). An estimated seven percent of historic SRA cover remains in the lower Sacramento River and its four major sloughs (including Georgiana Slough) mostly as the result of levee bank protection projects. Due to the continuing loss of this aquatic resource, SRA is considered by USFWS to be a Resource Category 1. Impacts to SRA are considered to be significant.

Urban:

Urban habitat in the planning area is concentrated in the City of Isleton and along Tyler Island Bridge Road. Non-native ornamental vegetation, including trees, shrubs, ground covers and lawns, occurs throughout the urban habitat.

Wildlife

The different wildlife habitats in the Plan area provide foraging and/ or breeding habitat for a wide variety of wildlife species. Species that inhabit or transit through the Delta region include fish, amphibian, reptiles, mammals, and birds.

Invertebrates:

Among the many species of invertebrates that may occur in the Plan area is the Valley elderberry longhorn beetle (VELB). The VELB is dependant on elderberry shrubs for its life cycle. Blue elderberry shrubs, which provide habitat for the VELB, were observed in several places in the Plan area.

Amphibians/Reptiles:

Amphibian species in the p[laning area may include Bullfrog, Pacific treefrog, and Western toad. Reptile species that may occur include Western terrestrial and Western aquatic garter snakes (*Thamnophis elegans* and *T. couchii*) and Western fence lizard (*Sceloporus occidentalis*). Western pond turtle (*Clemmys marmorata*) are likely to occur in the Sacramento River near the City of Isleton.

Birds:

The riparian habitats along the Sacramento River and Georgiana and Jackson Sloughs provide nesting and foraging habitat for numerous bird species including Nuttall's woodpecker, Bewick's wren, Black phoebe, European starling, California towhee, California quail, Scrub Jay, Red-shouldered hawk, and Yellow-billed magpie. The agricultural fields provide foraging habitat for a variety of bird species such as Brewer's blackbird, Brown-headed cowbird, Killdeer, and Western meadowlark. Other birds that may use the irrigation ditches and sloughs include American coot, Mallard, and Red-winged blackbird. Raptors (birds of prey) that forage in the Delta include Black-shouldered kite, Northern harrier, Red-tailed hawk, and Swainson's hawk.

There are three Swainson's hawk Rarefind nest records on the Isleton quad; no nest records appear on the Rio Vista quad. A total of 17 nest records are known from twelve quads within 10 miles of the Plan area (see Table III-7) including one nest record within the Plan area. This species is known to forage and nest along the Sacramento River in the vicinity of the project during spring and summer months.

Mammals:

Small terrestrial mammals that may inhabit the Plan area include Botta's pocket gopher and various species of mice, rats, and squirrels. Larger terrestrial mammals inhabiting or transiting through the planning area include Beaver, Opossum, skunk, Raccoon, and River otter. Several species of bats have ranges that overlap the area which largely forage on insects and may occur while foraging over open fields, above the tree canopies and over open water. Individual bats may use man-made structures and spaces under bark of large trees for day roosting. Some man-made structures could be suitable for colonial bat roosts.

TABLE III-7

SWAINSON'S HAWK RECORDS WITHIN 10 MILES OF ISLETON

Dozier* Northwest/0**	Liberty Island North/0	Courtland North/7	Bruceville Northeast/6
Birds Landing West/0	Rio Vista –/0	Isleton –/3	New Hope East/0
Antioch North Southwest/0	Jersey Island South/0	Bouldin Island South/1	Terminous Southeast/0

* USGS Quad Name

** Geographic position in relation to Isleton and Rio Vista Quads/Number of unique records

Fisheries

The Sacramento River supports important sport and commercial fisheries. Anadromous fish produced in the River include Chinook salmon (*Oncorhynchus tshawytscha*), Steelhead trout (*Oncorhynchus mykiss*), American shad (*Alosa sapidissima*), Striped bass (*Morone saxatilis*), and Green and White sturgeon (*Acipenser medirostris* and *A. transmontanous*; USFWS, 1966). Warmwater game fish found in the River include Channel and White catfish (*Ictalurus punctatus* and *I. catus*); Largemouth, Smallmouth, and Spotted bass (*Micropterus salmonides, M. dolomieui,* and *M. punctulatus*); and various sunfishes (Centrarchidae; USFWS, 1966). Central Valley steelhead, Delta smelt, Green sturgeon, River lamprey, Sacramento splittail, and Winter-run chinook salmon are special-status species that are known from or could potentially use the Sacramento River and sloughs within the planning area.

The Delta smelt is a resident fish in the Delta with an historical distribution ranging from Suisun Bay to the City of Sacramento on the Sacramento River and Mossdale on the San Joaquin River (59 FR 65256). Spawning has been recorded in Montezuma and Suisun sloughs and their tributaries north of Suisun Bay, in the Sacramento River up to Rio Vista, and in Barker, Lindsey, Cache, Georgiana, Prospect, Beaver and Hog and Sycamore sloughs (Radtke 1966 and Wang 1986 in 58 FR 12854; and Wang, 1991 in 59 FR 65256).

Special-Status Species

The CNDDB (California Natural Diversity Data Base)/Rarefind report and data received from the US Fish abd Wildlife Service were reviewed to determine special-status wildlife and plant species that could occur in the project planning area. Table III-6 presents the list of species evaluated for the presence of suitable habitat.

The Biological Resources Evaluation includes a detailed discussion on habitat, biology, range, and occurrence records for the special-status species for which suitable or marginal habitat is present, and whose known range overlaps or is near the planning area. (Sycamore Environmental, 1998). These species include the following: Valley elderberry longhorn beetle, Winter-run chinook salmon, Delta smelt, Central Valley steelhead, Sacramento splittail, Green sturgeon, River lamprey, Northwestern pond turtle, Giant garter snake, Western burrowing owl, and Swainson's hawk. Impact analyses are presented in the EIR contained in this document.

Plant Taxa of Concern:

Habitat for Mason's liliaeopsis, a state rare plant and federal species of concern occurs within the plan- ning area. The Northern California black walnuts occurring in the riparian woodlands are federal species of concern. The riparian corridors along the Sacramento River and Georgiana Slough are sensitive natural communities considered by USFWS to be Resource Category 1.

Animal Taxa of Concern:

A number of special status wildlife species have been recorded or could potentially occur in Sacramento county within the planning area. These species are either state- or federally listed as threatened or endangered, or are species of special concern. TableIII-6 presents information on the status of each species, its preferred habitat, the occurrence of potentially suitable habitat within the project study area, and Sycamore Environmental's field survey observation records for each species.

Potentially suitable habitat for several of the animal taxa occurs within the planning area, including California tiger salamander, California red-legged frog, Northwestern pond turtle which may use the aquatic habitats associated with the planning area. The open fields and grasslands provide suitable foraging habitat for a number of bird taxa of concern, including Ferruginous hawk, Western burrowing owl, and Mountain plover.

Wetlands and Waters of the U.S.

Waters of the U.S. occur within the Isleton planning area (Sycamore Environmental, 1998).

Definitions:

The United States Army Corps of Engineers (Corps) and the United States Environmental Protection Agency (EPA) regulate the discharge of dredge and fill material into "waters of the United States" under Section 404 of the Clean Water Act. The Corps jurisdiction over "waters of the United States" extends to the "ordinary high water mark provided the jurisdiction is not extended by the presence of wetlands" (33 CFR Part 328 Section 328.4). Waters of the United States are defined as:

> All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, all interstate waters including interstate wetlands, all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which would affect interstate or foreign commerce, including such waters: Which are or could be used by interstate or foreign travelers for recreational or other purposes, or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce, or which are used or could be used for industrial purposes by industries in interstate commerce; all impoundments of waters otherwise defined as waters of the United States interstate commerce, tributaries of waters identified in paragraphs 1-4 of this section, the territorial sea, and wetlands adjacent to waters (40 CFR 230.3).

Wetlands are defined for regulatory purposes as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3, 40 CFR 230.3). Wetlands also include less conspicuous wetland types such as vernal pools and other seasonal wetlands.

The Corps will typically take jurisdiction over the portion of a project study area that contains waters of the United States and adjacent or isolated wetlands.

Jurisdictional Information:

Potential wetlands and waters of the U.S. were observed during the reconnaisance surveys. A formal Section 404 delineation in accordance with the procedures of the U.S. Army Corps of Engineers Wetland Delineation Manual (Corps 1987) was not conducted as part of the reconnaisance surveys. A jurisdictional delineation, verified by the Corps, would provide an inventory of all wetlands and waters of the U.S. in the Plan area.

The Sacramento River and Georgiana, Jackson, and Smith Sloughs are waters of the U.S. The Sacramento River and Georgiana Slough are navigable waters. Other jurisdictional waters of the U.S. may be present in the Plan area. Jurisdictional wetlands are likely to occur within the Plan area. The Natural Resources Conservation Service (NRCS) has regulatory jurisdiction over agricultural lands. The NRCS may consider the agricultural lands to be either prior converted wetlands or farmed wetlands.

<u>Regulatory Considerations: Permits & Mitigation Plans</u>

Section 404/ Section 10 Permits:

The U.S. Army Corps of Engineers (Corps) regulates the discharge of dredge and fill material into waters of the U.S. and wetlands under Section 404 of the Clean Water Act and regulates navigable waterways under the various Rivers and Harbors Acts. The Corps must be consulted prior to any activity that would occur within the limits of its jurisdiction.

Under Section 404 (33 U.S.C. 1344) of the Clean Water Act (CWA), as amended, the Corps of Engineers retains primary responsibility for permits to discharge dredged or fill material into waters of the United States. The Corps takes jurisdiction under Section 404 for traditionally navigable waters; all interstate waters, including interstate wetlands, all other waters including lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet

meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce; all impoundments of water that fit these definitions; territorial seas; and wetlands adjacent to waters, other than adjacent to other wetlands (33 C.F.R. 328.3).

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been authorized by the Chief of Engineers.

Various projects may be permitted under a Section 404 Nationwide general permit from the Corps provided that the activity meets certain criteria. Section 404 Nationwide permits are issued when a discharge causes the loss of more than 1/3 acre but less than 3 acres of waters of the U.S. and/or wetlands. If the discharge causes the loss of more than 3 acres of waters of the U.S. and/or wetlands or loss of waters of the U.S. for a distance greater than 500 linear feet of the stream bed, the Corps may permit the project under an Individual permit.

The Corps may authorize construction on a navigable river with a combination of Section 404 Nationwide Permits and a Section 10 Letter of Permission.

If required, an application, based on a verified delineation, will be made to the Sacramento District of the Corps for the appropriate permit. The permit conditions will be followed by the Applicant. The type of permit(s) needed will be determined by the Corps. If required as a result of permit conditions, wetland mitigation measures would be documented in a formal Wetland Mitigation and Monitoring Plan that would be submitted to the U.S. Army Corps of Engineers as an appendix to a Pre-Construction Notification.

Section 7 Consultation:

The Corps is required under Section 7 of the Endangered Species Act (16 U.S.C. 1536) to consult with the U.S. Fish and Wildlife Service to insure that any actions authorized by the Corps do not jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of habitat of such species which is determined to be critical. When listed species or designated critical habitat are in a proposed project area, a biological assessment must be prepared to determine if the proposed project may affect a listed species or its habitat. Based on the biological assessment, the Corps initiates formal consultation with the USFWS and requests a biological opinion. Which must be obtained prior to the issuance of Corps permit that may affect listed species.

401 Water Quality Certification or Waiver:

If a Section 404 permit is required by the Corps, a Water Quality Certification must be obtained from the RWQCB (Regional Water Quality Control Board). In accordance with General Condition 9 of a Nationwide Permit, a Water Quality Certification or waiver from the Board must be obtained before the Section 404 permit can become effective.

1601 Streambed Alteration Permit:

The California Department of Fish and Game (DFG) has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Fish & Game Code §1802). DFG also has regulatory authority wherever water flows in the State, including ditches dug for flood control.

Consultation with DFG will also be required prior to any project activity that will divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake. If required, a §1601-1603 Streambed Alteration Agreement will be requested from DFG by the City of Isleton or project applicants prior to commencement of construction. A revegetation and erosion control plan may be required as part of the agreement. Fees are required for Streambed Alteration Agreements based on construction costs of the project.

TABLE III-8

SUMMARY OF SPECIAL STATUS SPECIES EVALUATED

SPECIAL-STATUS SPECIES [a]	State/ Federal Status [b]	HABITAT	Habitat Present? [c]
Invertebrates			
Antioch Dunes anthicid beetle *Anthicus antiochensis*	--/SC	Known only from the Antioch Dunes.	Marginal
Sacramento anthicid beetle *Anthicus sacramento*	--/SC	Restricted to sand dune areas of the Sacramento-San Joaquin Delta; inhabits sand slipfaces among bamboo and willow.	Marginal
Conservancy fairy shrimp *Branchinecta conservatio*	--/E	Endemic to the grasslands of the northern two-thirds of the central valley; found in large, turbid pools. Inhabit vernal pools located in swales formed by old, braided alluvium; filled by winter/spring rains, which evaporate by May or June.	No
Vernal pool fairy shrimp *Branchinecta lynchi*	--/T	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains, in vernal pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	No
Vernal pool tadpole shrimp *Lepidurus packardi*	--/E	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	No
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	--/T	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*) shrubs. Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	Yes; Shrubs observed
Delta green ground beetle *Elaphrus viridis*	--/T	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis AFB. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25-100% cover.	No
Amphibians			
California tiger salamander *Ambystoma californiense*	SC/C	Annual grasslands & grassy understory of valley-foothill hardwood habitats in central & northern California. Need underground refuges, especially ground squirrel burrows; requires vernal pools or other seasonal water sources for breeding	No
California red-legged frog *Rana aurora draytonii*	SC/T	Lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat.	No
Western spadefoot *Scaphiopus hammondii*	SC/SC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools or slow flowing drainages are used for breeding and egg-laying.	No
Reptiles			
Giant garter snake *Thamnophis gigas*	T/T	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals & irrigation ditches. This is the most aquatic of the garter snakes in California.	Yes
Northwestern pond turtle *Clemmys marmorata marmorata*	SC/SC	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nests sites may be found up to 0.5 km from water.	Yes

Table III-8, cont.

SPECIAL-STATUS SPECIES [a]	State/ Federal Status [b]	HABITAT	Habitat Present? [c]
Fish			
Green sturgeon *Acipenser medirostris*	SC/SC	Spawn in the Sacramento River and the Klamath River at temps between 8-14 C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	Yes; Sacramento River
Delta smelt *Hypomesus transpacificus*	T/T	Sacramento-San Joaquin Delta, seasonally in Suisun bay, Carquinez Strait & San Pablo Bay, seldom found at salinities > 10 ppt, most often at salinities < 2 ppt.	Yes; Sacramento River
Delta smelt critical habitat	ST/T	Waters of lower and middle reaches of the Sacramento-San Joaquin Delta.	No
River lamprey *Lampetra ayresi*	SC/--	Lower Sacramento River, San Joaquin River & Russian River. May occur in coastal streams north of San Francisco Bay. Adults need clean, gravelly riffles, ammocoetes need sandy backwaters or stream edges, good water quality & temps < 25 C	Yes; Sacramento River
Pacific lamprey *Lampetra tridentata*	--/SC	Sacramento River	Yes; Sacramento River
Central Valley steelhead *Oncorhynchus mykiss*	SC/PT	Streams in coastal California watersheds with cool, swift, shallow water & clean loose gravel for spawning. Requires suitably large pools in which to spend the summer.	Yes; Sacramento River
Winter-run chinook salmon *Oncorhynchus tshawytscha*	E/E	Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 & 14 C for spawning.	Yes; Sacramento River
Winter-run chinook salmon critical habitat	SE/E	Large coastal streams and rivers from the Sacramento River north.	No
Sacramento splittail *Pogonichthys macrolepidotus*	SC/T	Endemic to the lakes and rivers of the central valley, but now confined to the delta, Suisun Bay & associated marshes. Slow moving river sections, dead end sloughs. Require flooded vegetation for spawning & foraging for young.	Yes; Sacramento River
Longfin smelt *Spirinchus thaleichthys*	--/SC	Sacramento River	Yes; Sacramento River

Table III-6, cont.

SPECIAL-STATUS SPECIES [a]	State/ Federal Status [b]	HABITAT	Habitat Present? [c]
Birds			
Tricolored blackbird *Agelaius tricolor*	SC/SC	Highly colonial species, most numerous in the Central Valley & vicinity. Largely endemic to CA. Requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony.	Yes – foraging; Marginal nesting
Western burrowing owl *Athene cunicularia hypugea*	SC/SC	Found in open, dry annual or perennial grasslands, deserts & scrub lands characterized by low-growing vegetation. A subterranean nester, dependent upon burrowing mammals, most notably those of the California ground squirrel.	Yes
Aleutian Canada goose *Branta canadensis leucopareia*	--/T	Winters on lakes and inland prairies. Forages on natural pasture or that cultivated in grain; loafs on lakes, reservoirs, and ponds.	Marginal foraging; No nesting
Swainson's hawk *Buteo swainsoni*	T/--	Breeds in stands with few trees in juniper-sage flats, riparian areas and in oak savanna. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Yes
Ferruginous hawk *Buteo regalis*	SC/SC	Open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, & fringes of pinyon-juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Yes
Mountain plover *Charadrius montanus*	SC/PT	Short grass plains, low rolling grassy hills, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms. Short vegetation, bare ground & flat topography. Prefer grazed areas & areas with burrowing rodents.	Marginal foraging; No nesting
Little willow flycatcher *Empidonax traillii brewsteri*	E/--	Inhabit extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters; 2000-8000 ft elev. Require dense willow thickets for nesting/roosting. Low, exposed branches are used for singing posts/hunting perches.	No (outside current breeding range)
American peregrine falcon *Falco peregrinus anatum*	E/E	Breeds near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	Yes – foraging; No nesting
Bald eagle *Haliaeetus leucocephalus*	E/T	Ocean shorelines, lake margins, and river courses for both nesting and wintering. Most nests within one mile of water. Nests in large old-growth, or dominant live tree w/open branches, especially ponderosa pine. Roosts communally in winter.	No
Black rail *Laterallus jamaicensis*	T/SC	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt marsh heavily grown to pickleweed; also in fresh-water and brackish marshes, all at low elevation.	No
White-faced ibis *Plegadis chihi*	SC/SC	Shallow fresh-water marsh. Dense tule thickets for nesting interspersed with areas of shallow water for foraging.	No

Table III-8, cont.

SPECIAL-STATUS SPECIES [a]	State/ Federal Status [b]	HABITAT	Habitat Present? [c]
Mammals			
Greater western mastiff-bat *Eumops perotis californicus*	SC/SC	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees & tunnels.	Yes
Small-footed myotis bat *Myotis ciliolabrum*	--/SC	Occurs in a wide variety of habitats with sources of water (ponds, streams) over which to feed; roost in buildings, mines, caves, or crevices; also in abandoned swallow nests, under bridges, and in trees.	Yes
Long-eared myotis bat *Myotis evotis*	--/SC	Found in all brush, woodland & forest habitats from sea level to about 9000 ft.; prefers coniferous woodlands & forests. Nursery colonies in buildings, crevices, spaces under bark, & snags. Caves used primarily as night roosts.	Yes
Fringed myotis bat *Myotis thysanodes*	--/SC	In a wide variety of habitats, optimal habitats are pinyon-juniper, valley foothill hardwood & hardwood-conifer. Uses caves, mines, buildings or crevices for maternity colonies and roosts.	Yes
Long-legged myotis bat *Myotis volans*	--/SC	Most common in woodland & forest habitats above 4000 ft. trees are important day roosts, caves & mines are night roosts. Nursery colonies usually under bark or in hollow trees, but occasionally in crevices or buildings.	Yes
Yuma myotis bat *Myotis yumanensis*	--/SC	Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	Yes
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	SC/SC	Forest habitats of moderate canopy & moderate to dense understory. Also in chaparral habitats. Constructs nests of shredded grass, leaves & other material. May be limited by availability of nest-building materials.	Marginal
San Joaquin Valley woodrat *Neotoma fuscipes riparia*	SC/PE	Riparian areas along the San Joaquin, Stanislaus & Tuolumne rivers. Need areas with mix of brush & trees. Needs suitable nesting sites in trees, snags, or logs.	No (outside current known range)
Townsend's western big-eared bat *Corynorhinus townsendii townsendii*	SC/SC	Humid coastal regions of northern & central California. Roost in limestone caves, lava tubes, mines, buildings etc. Will only roost in the open, hanging from walls & ceilings. Roosting sites limiting. extremely sensitive to disturbance	Yes
Riparian brush rabbit *Sylvilagus bachmani riparius*	E/PE	Riparian areas on the san Joaquin River in northern Stanislaus County. Dense thickets of wild rose, willows, and blackberries.	No
San Joaquin pocket mouse *Perognathus inornatus*	--/SC	Typically found in grasslands and blue oak savannas. Needs friable soils.	Marginal

Table III-8, cont.

SPECIAL-STATUS SPECIES [a]	State/ Federal Status/ CNPS [b]	HABITAT	Habitat Present? [c]
Plants			
Suisun Marsh aster *Aster lentus*	-- / SC / 1B	Marshes and swamps (brackish and freshwater). Endemic to the Sac/San Joaquin River delta. Most often seen along sloughs with *Phragmites*sp., *Scirpus* sp., blackberry, *Typha* sp., etc. 0-3 m.	Yes
Valley spearscale *Atriplex joaquiniana*	-- / SC / 1B	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata*, *Frankenia*, etc. 1-250 m.	Yes
California hibiscus *Hibiscus lasiocarpus*	-- / -- / 2	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks & low peat islands in sloughs; in CA., known from the delta watershed. 0-150 m.	Yes
Northern California black walnut *Juglans californica* var. *hindsii*	-- / SC / 1B	Riparian forest, riparian woodland. Two extant native stands remain; widely naturalized. Deep alluvial soil associated with a creek or stream. 0-395 m.	Yes; Observed
Delta tule-pea *Lathyrus jepsonii* var. *jepsonii*	-- / SC / 1B	Freshwater and brackish marshes. Most of distribution restricted to the Sacramento/San Joaquin River delta. Often found with *Typha* sp., *Aster lentus*, *Rosa californica*, *Juncus* spp., *Scirpus* spp., etc. Usually on marsh and slough edges.	Yes
Mason's lilaeopsis *Lilaeopsis masonii*	R / SC / 1B	Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. 0-10 m.	Yes
Delta mudwort *Limosella subulata*	-- / -- / 2	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of delta rare plants. Usually on mud banks of the delta in marshy or scrubby riparian associations; often with *Lilaeopsis masonii*. 0-3 m.	Yes
Sanford's arrowhead *Sagittaria sanfordii*	-- / SC / 1B	Marshes and swamps in standing or slow-moving freshwater ponds, marshes, and ditches.	Yes
Blue skullcap *Scutellaria lateriflora*	-- / -- / 2	Meadows, seeps, marshes, and swamps. -3 to 500 m	Yes

[a] **Status Categories**

Federal status determined from the USFWS letter. State status determined from *State and Endangered and Threatened Animals of California* (January 1999), *Special Animals* (March 1998), and/or *Special Plants List* (January 1999), prepared by DFG Natural Diversity Data Base.
CNPS status determined from *CNPS Inventory of Rare and Endangered vascular plants of California* (CNPS 1994). Codes used in table are as follows:

E = Endangered; T = Threatened; P = Proposed; R = California Rare; * = Possibly extinct.
C = Candidate: Taxa for which the Fish and Wildlife Service has sufficient biological formation to support a proposal to list as endangered or threatened.
SC = Service Species of Concern; Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
CSC = DFG "Species of Special Concern."

[b] **Sources**

1 = From USFWS letter.
2 = From CNDDB/ RareFind.

[c] Sources of information used to evaluate habitat are listed in Section II. A. Jennings and Hayes (1994) was used for additional information on amphibian and reptile species of special concern.