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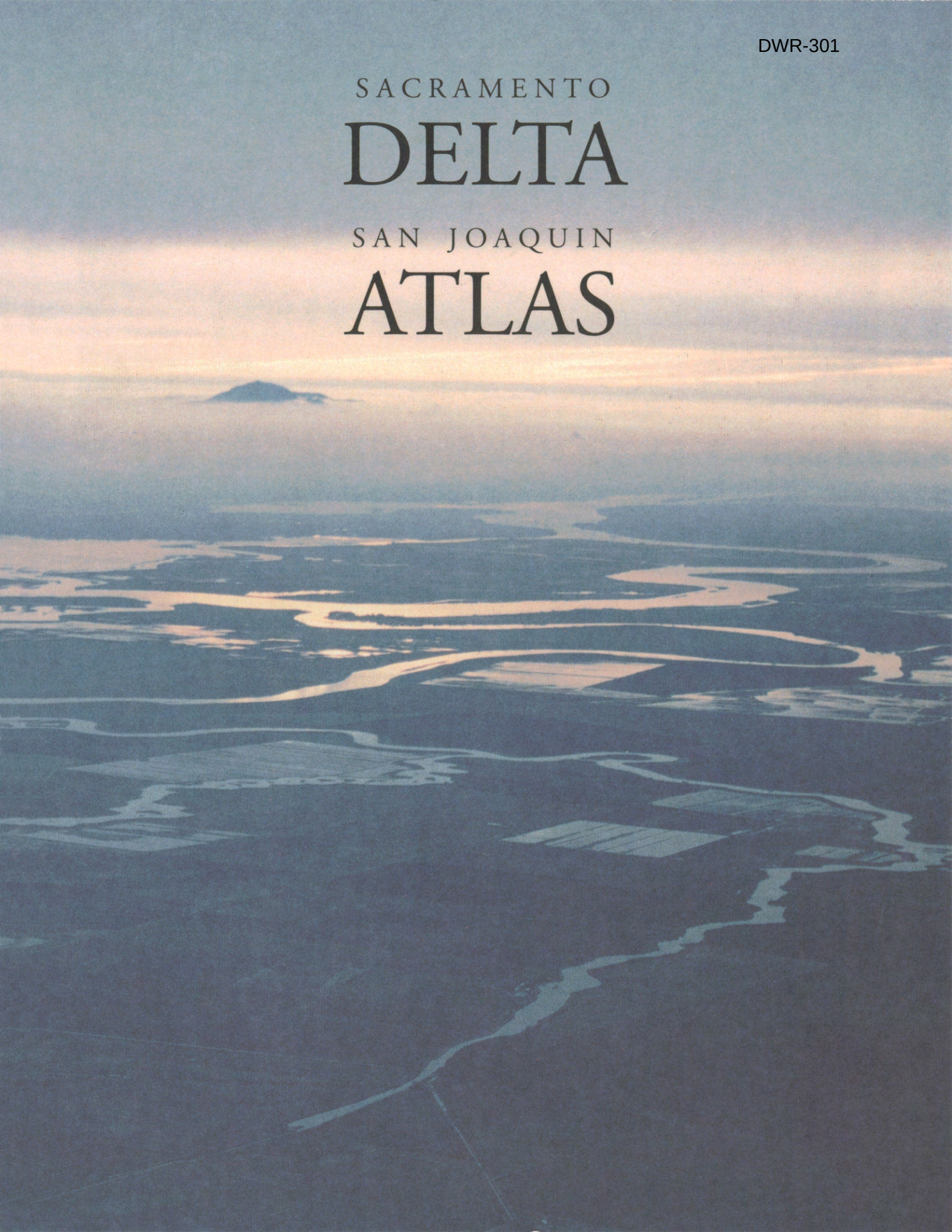
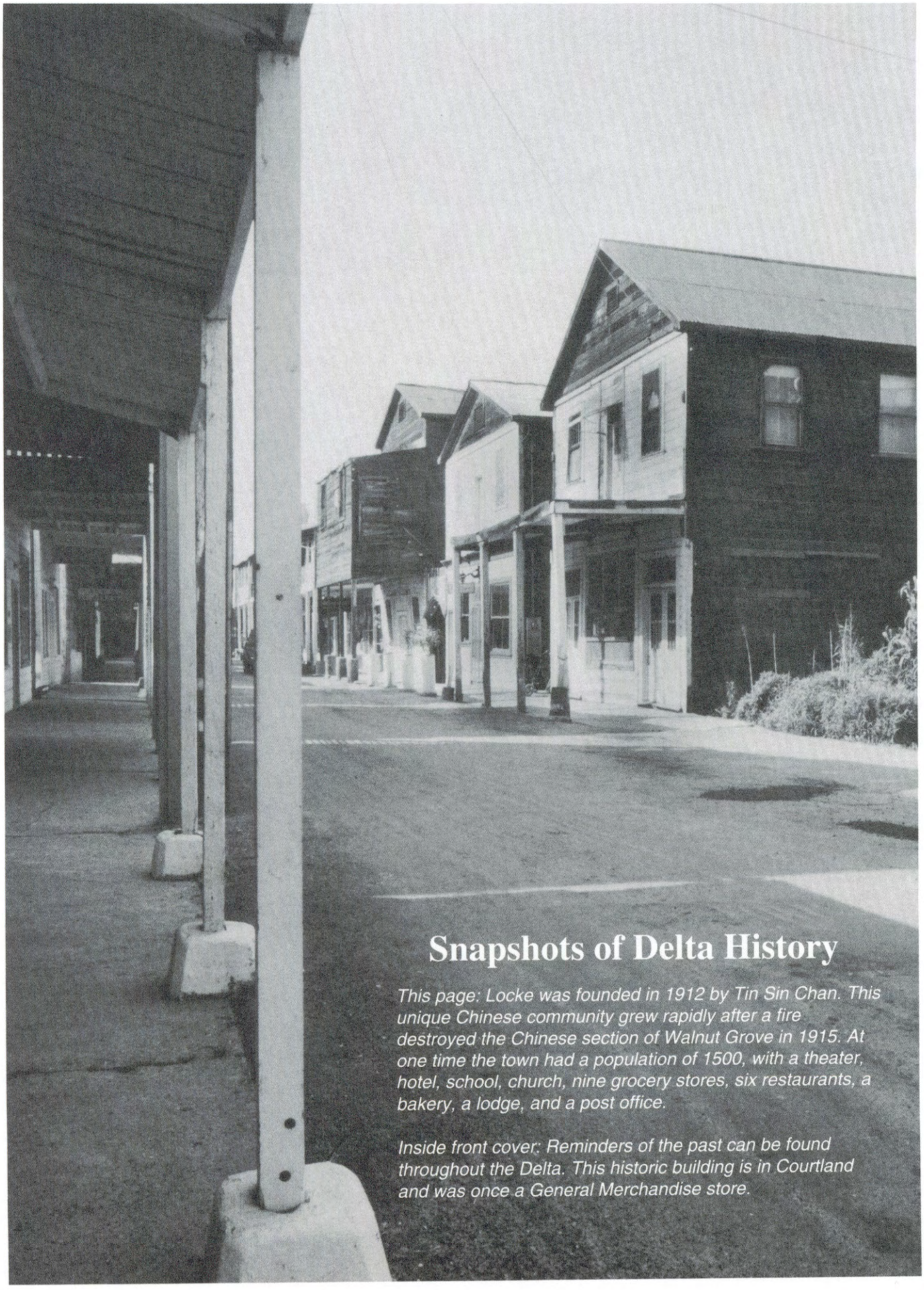
SACRAMENTO DELTA SAN JOAQUIN ATLAS





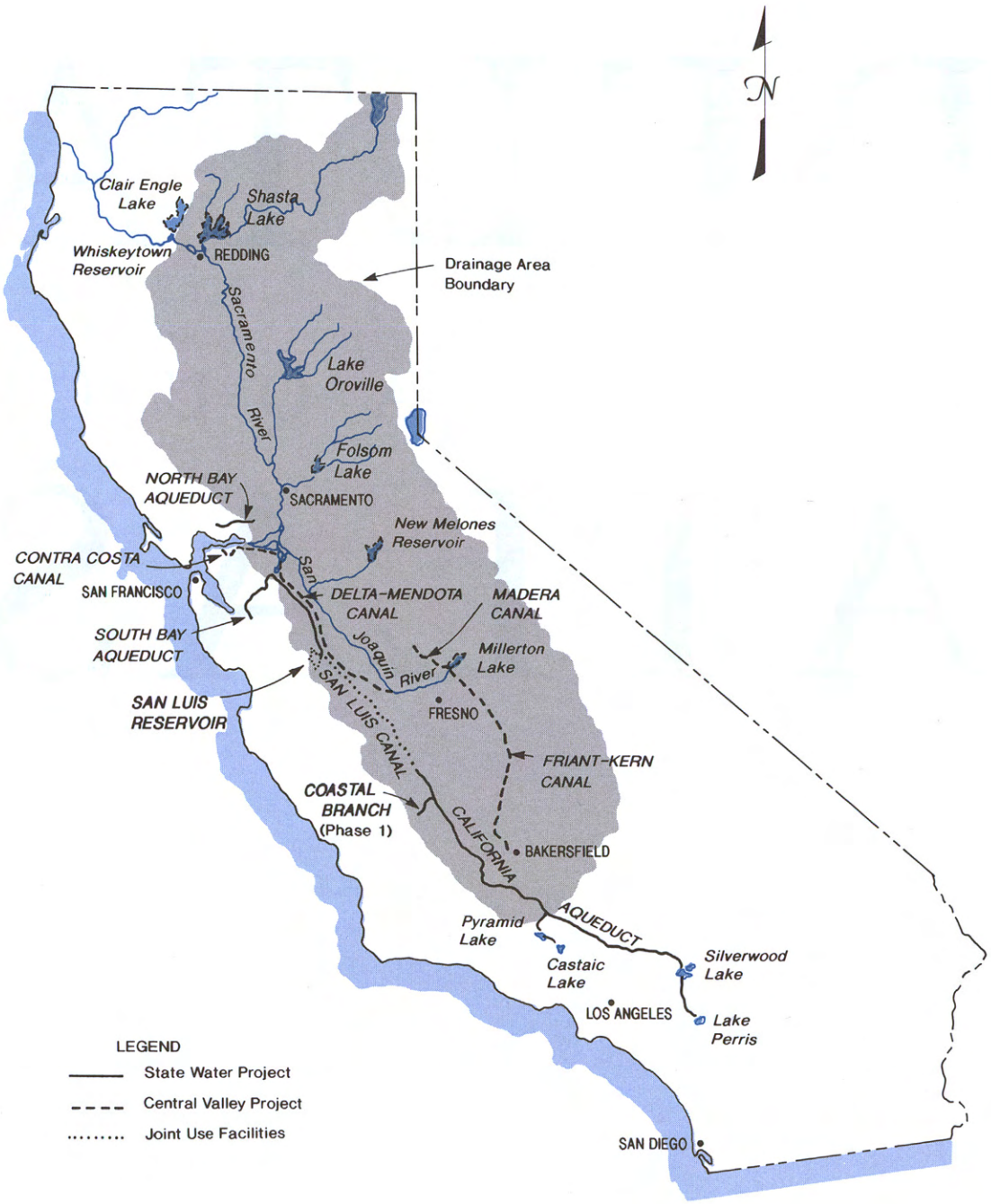
Snapshots of Delta History

This page: Locke was founded in 1912 by Tin Sin Chan. This unique Chinese community grew rapidly after a fire destroyed the Chinese section of Walnut Grove in 1915. At one time the town had a population of 1500, with a theater, hotel, school, church, nine grocery stores, six restaurants, a bakery, a lodge, and a post office.

Inside front cover: Reminders of the past can be found throughout the Delta. This historic building is in Courtland and was once a General Merchandise store.

SACRAMENTO
DELTA
SAN JOAQUIN
ATLAS

California Department of Water Resources
Reprinted 7/95



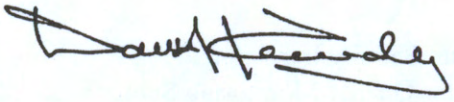
Major Features of State Water Project and Central Valley Project

FOREWORD

The Delta of the Sacramento and San Joaquin rivers is California's water supply crossroads. It is the major collection point for water that serves over 20 million people, two-thirds of our State's population.

The maze of islands and channels lying at the confluence of these two large rivers has long been the focal point of debate surrounding a number of complicated water-related issues of statewide importance. People with a wide variety of interests—agricultural, urban, industrial, environmental, and recreational—have a vital stake in the Delta and a need to understand the physical Delta and its complex interrelationships.

This atlas provides information that we hope will be helpful in addressing the complex problems of the estuary. The atlas is a revision of the Sacramento-San Joaquin Delta Atlas that was published in 1987. It contains updates on many Delta facts and features. It also introduces new information on the Suisun Marsh and tides and hydrology in the Delta as well as in San Francisco Bay.



David N. Kennedy, Director
Department of Water Resources
The Resources Agency
State of California

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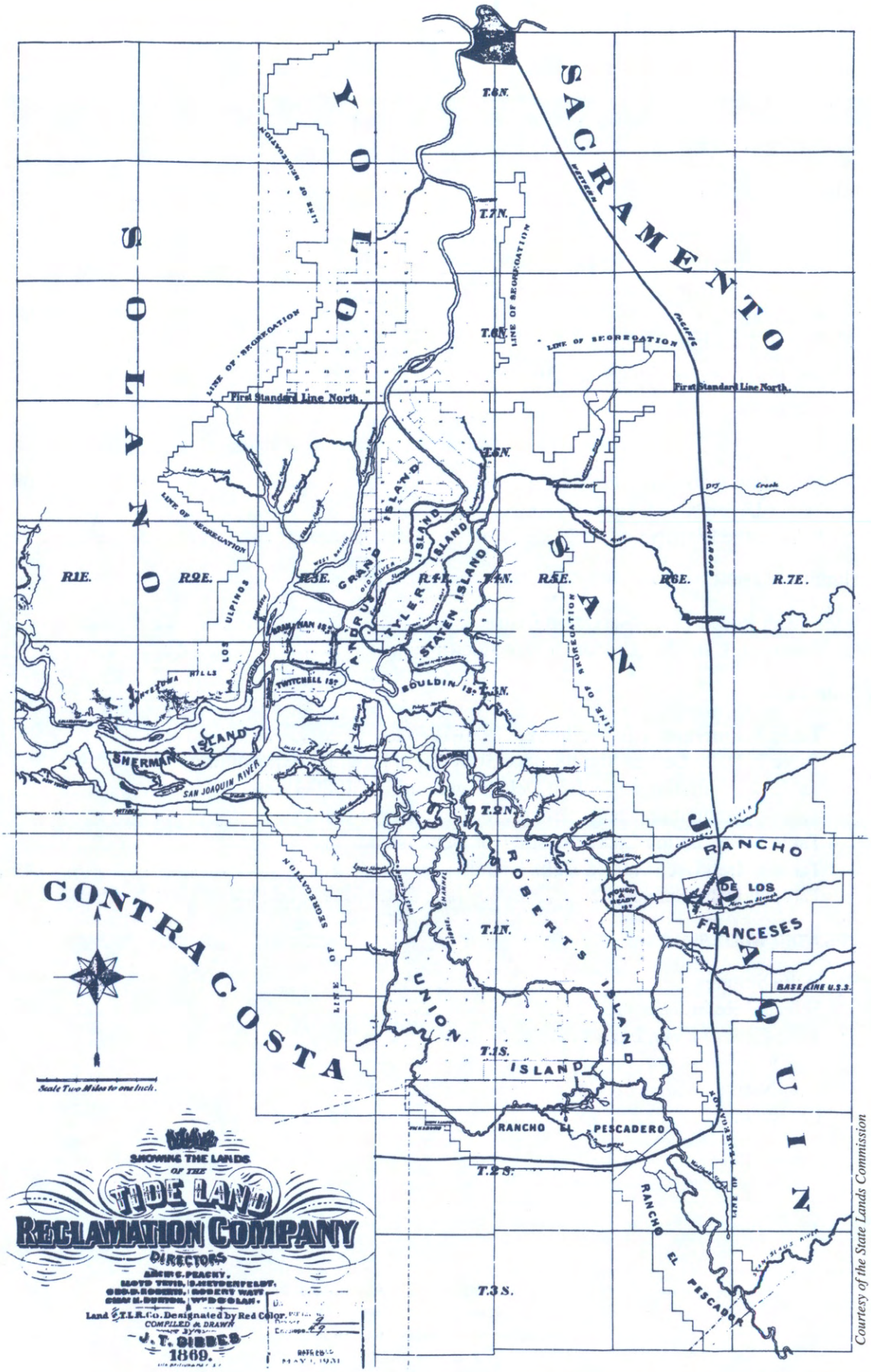
Copies of the Sacramento-San Joaquin Delta Atlas are available for $5.00 from:
State of California
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Make checks payable to Department of Water Resources. California residents add current sales tax.



Courtesy of the State Lands Commission

INTRODUCTION

The Delta is a unique and valuable resource and an integral part of California's water system. It receives runoff from over 40 percent of the State's land area including flows from the Sacramento, San Joaquin, Mokelumne, Cosumnes, and Calaveras rivers. The Delta provides habitat for many species of fish, birds, mammals, and plants; supports agricultural and recreational activities; and is the focal point for water distribution throughout the State.

The development of today's Delta began in late 1850 when the Swamp and Overflow Land Act conveyed ownership of all swamp and overflow land, including Delta marshes, from the federal government to the State of California. Proceeds from the sale of swampland by the State were to go toward reclaiming the swamplands. In 1861, the State Legislature created the Board of Swamp and Overflowed Land Commissioners to manage reclamation projects. In 1866, the Board's authority was transferred to county boards of supervisors. In 1868, the Legislature removed acreage ownership limitations and by 1871 most of California's swampland was in private ownership.

Developers first thought levees 4 feet high and 12 feet at the base would protect Delta lands from tides and river overflow, but that proved inadequate for Delta peat soils. By 1869, substantial levees had been constructed on Sherman Island and Twitchell Island by Chinese laborers, and in 1870 and 1871 the owners reaped bountiful harvests of grain and row crops. Small-scale reclamation projects were started on Rough and Ready Island and Roberts Island in the 1870s, but the peat soils showed their weakness as levees. The peat soils would sink, blow away when dry, and develop deep cracks and fissures throughout the levee system. Sherman and Twitchell Islands flooded annually in the early 1870s. By 1874, reclamation and preservation costs for Sherman Island's levees had totaled $500,000. This is equivalent to $6.2 million dollars today.

In the late 1870s, the developers had begun to realize that hand- and horse-powered labor could not maintain the reclaimed Delta islands. Steam-powered dredges began to be used to move the large volume of alluvial soils from the river channels to construct the large levees. These dredges were capable of moving material at about half the cost of hand labor.

The peak of Delta land reclamation was reached with the clamshell-type dredge, still commonly used. Advantages of this machine over its predecessors were versatility, ease of operation, and modest capital and operating costs.

After World War I, the number of operating dredges decreased greatly, as nearly all Delta marshland had been reclaimed. By this time, the Delta had been transformed from a large tidal marsh to the series of improved channels and leveed islands we know today.

The Delta covers 738,000 acres interlaced with hundreds of miles of waterways. Much of the land is below sea level and relies on more than 1,000 miles of levees for protection against flooding. Its land and waterways support communities, agriculture, and recreation, and provide essential habitat for fish and wildlife.

The Sacramento-San Joaquin Delta Atlas provides information for readers who wish to understand the complex interrelationships within the Delta and grasp its significance to the State.

WOLHONG CO.
GENERAL MERCHANDISE

DWR-301

Pete Wilson
Governor
State of California

David Kennedy
Director
Department of Water Resources

Douglas P. Wheeler
Secretary for Resources
Resources Agency

DELTA TIME LINE

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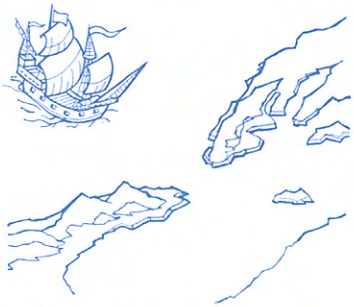
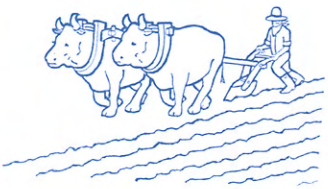


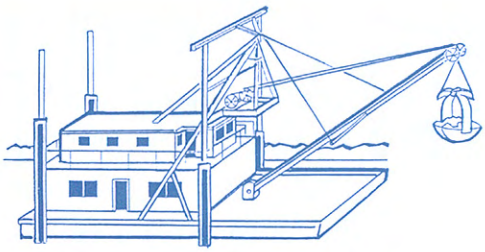


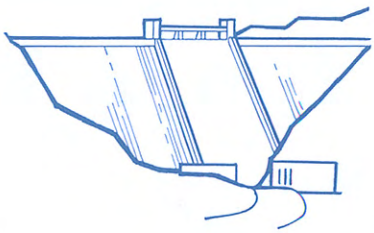
HISTORICAL

First recorded sighting of Delta — 1772

San Carlos explores San Francisco Bay — 1776

Settlers begin farming — 1849





FACILITIES

Dredges developed to build Delta levees — 1880-1916

Dredging of Stockton Deep Water Channel — 1933

Export begins via Contra Costa Canal — 1940

Shasta Dam and Reservoir — 1944

Delta-Mendota Canal and Delta Cross Channel — 1951

LEGISLATIVE

Federal Swamp and Overflow Act — 1850

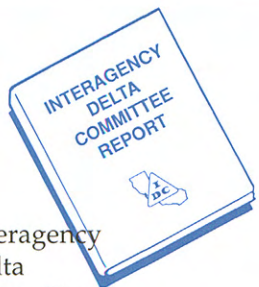
State Reclamation District Act — 1861

Federal Reclamation Act — 1902

State Reclamation Board — 1911

Federal Authorization of CVP — 1933

Burns-Porter Act and Delta Protection Act — 1959



ACTIONS

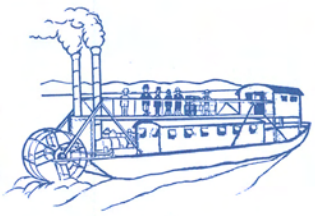
Hydraulic Mining Outlawed — 1884

Surface water right law revised — 1914

Delta salinity investigation — 1930

Interagency Delta Committee report recommends Peripheral Canal — 1965

Delta Water Rights D-1379 — 1971

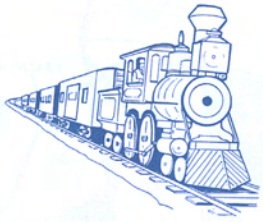


Gold Rush brings miners

1849

Sherman Island levee system

1869



Striped Bass introduced from the East Coast

1879

State population 1.5 million

1900

State population 30 million

1990

Sacramento Deep Water Channel

1963

Oroville Dam, Reservoir, and Fish Hatchery

1967

Delta Pumping Plant and Fish Facility

California Aqueduct completed to Southern California

1973

South Delta temporary agricultural flow control structures

1987

North Bay Aqueduct and Suisun Marsh salinity control gates

1988

Four new pumps added to Banks Delta Pumping Plant

1991

Voters approve SWP financing

1960

Way Bill Delta Levee Maintenance

1973

Senate Bill 200 specifies Peripheral Canal

1980

Voters defeat Prop 9 on SB 200

1982

CVP/SWP Coordinated Operation Agreement

1986

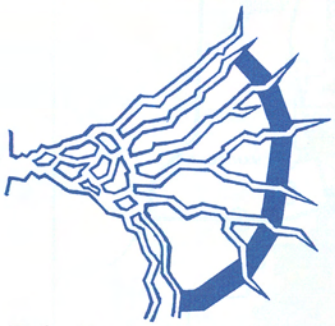
Senate Bill 34 to rebuild Delta Levees

1988

Delta Protection Act of 1992

Federal CVP Improvement Act (PL 102-575)

1992



Delta Environmental Advisory Committee concludes Peripheral Canal is necessary

1973

SWRCB issues Water Rights D-1485

1978

Racanelli Decision broadens SWRCB's authority.

DWR & DFG fishery mitigation agreement

1986

Study for improving drinking water quality

1988

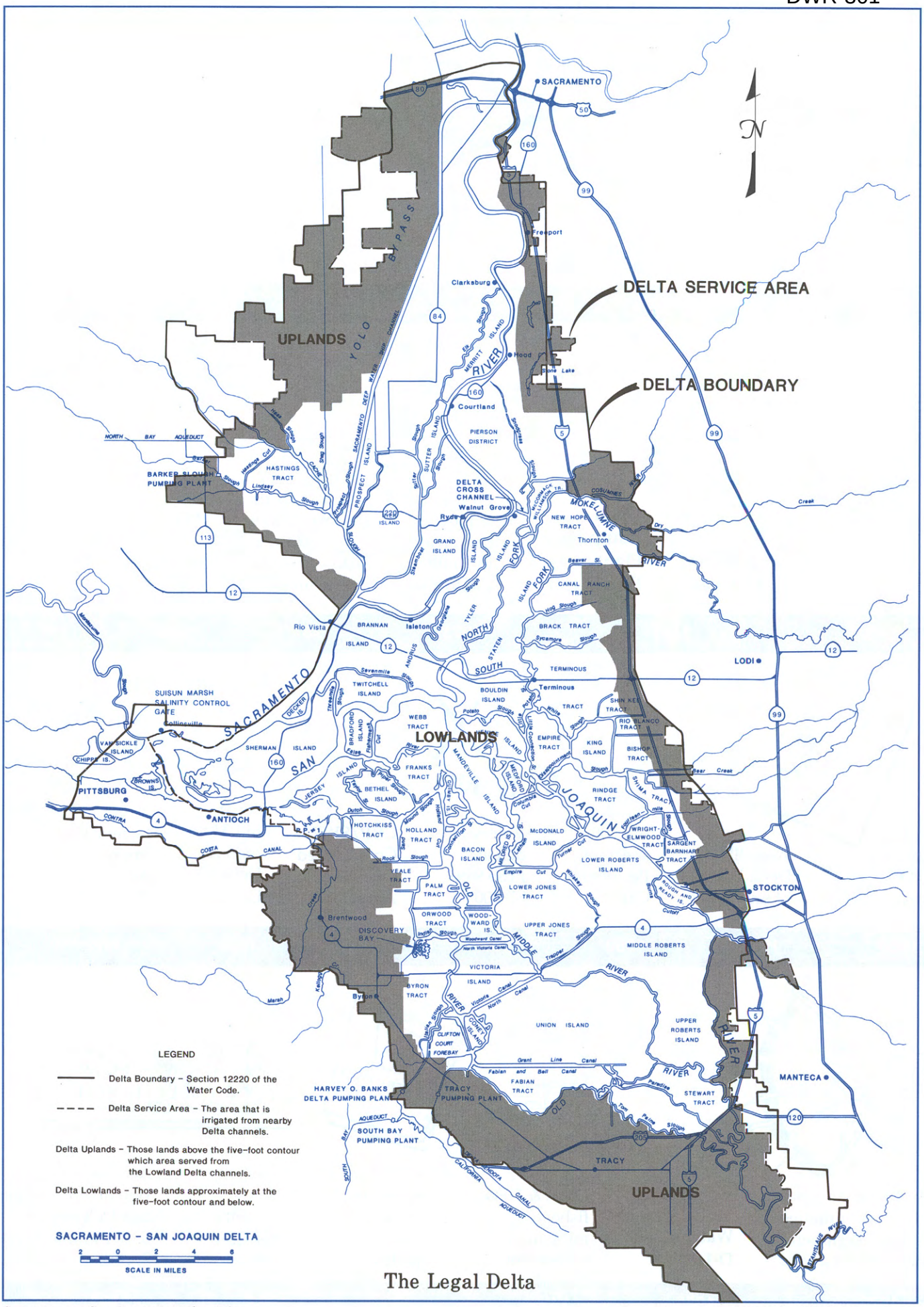
Governor's Water Policy--Bay-Delta Oversight Council

1992

Actions to protect Winter-run Salmon and Delta Smelt under Endangered Species Act

1993

For additional information, see page 111



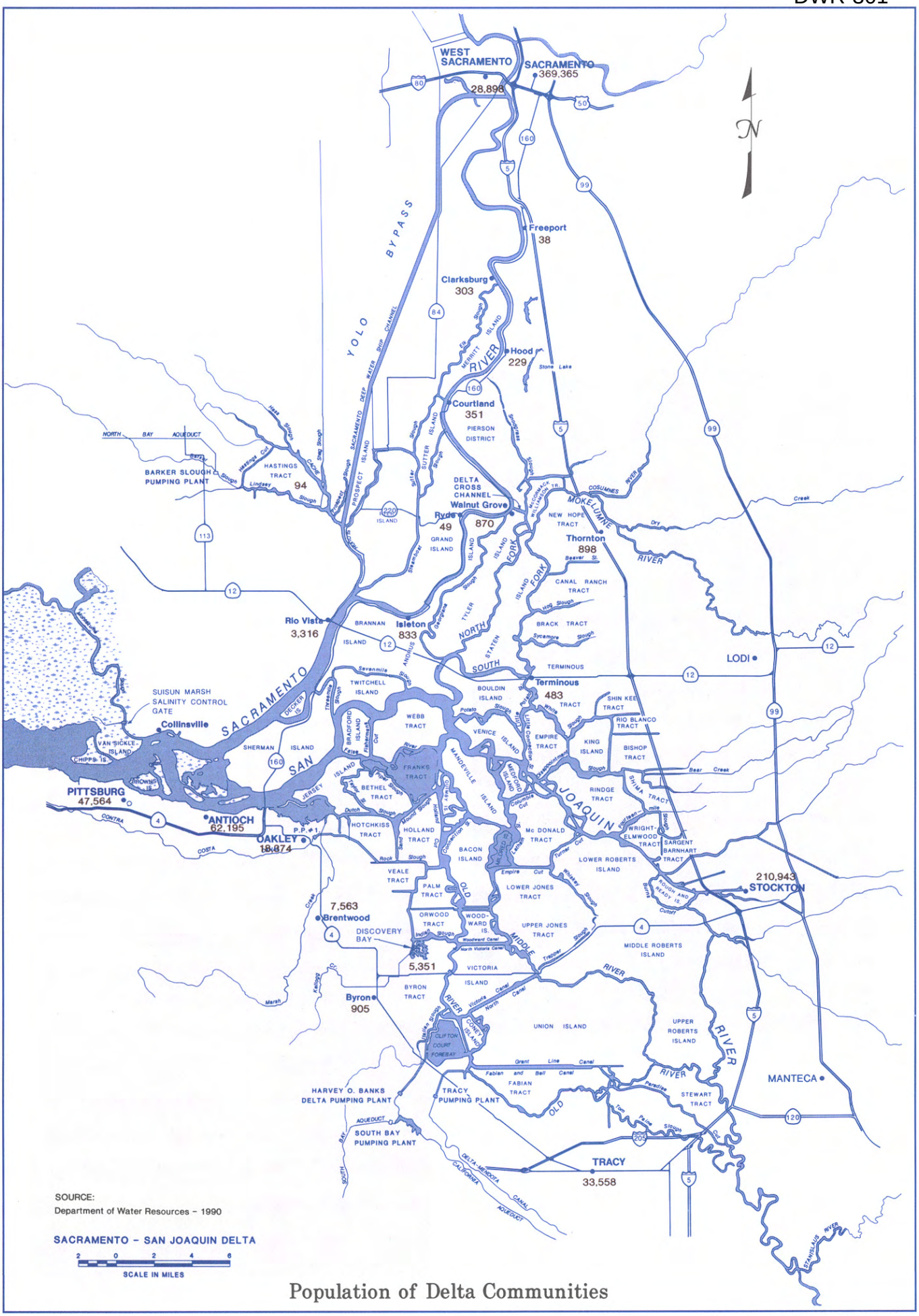
The Legal Delta

The Legal Delta

The Delta received its first official boundary in 1959 with the passage of the Delta Protection Act (Section 12220 of the Water Code). The map at left shows this statutory boundary. It also shows the Delta uplands and lowlands as well as the Delta service area, those irrigated lands within the Delta that receive water directly from its channels.

This high-altitude photograph shows a large portion of the Delta, including farmland, urban development, and flooded islands that have not been reclaimed.

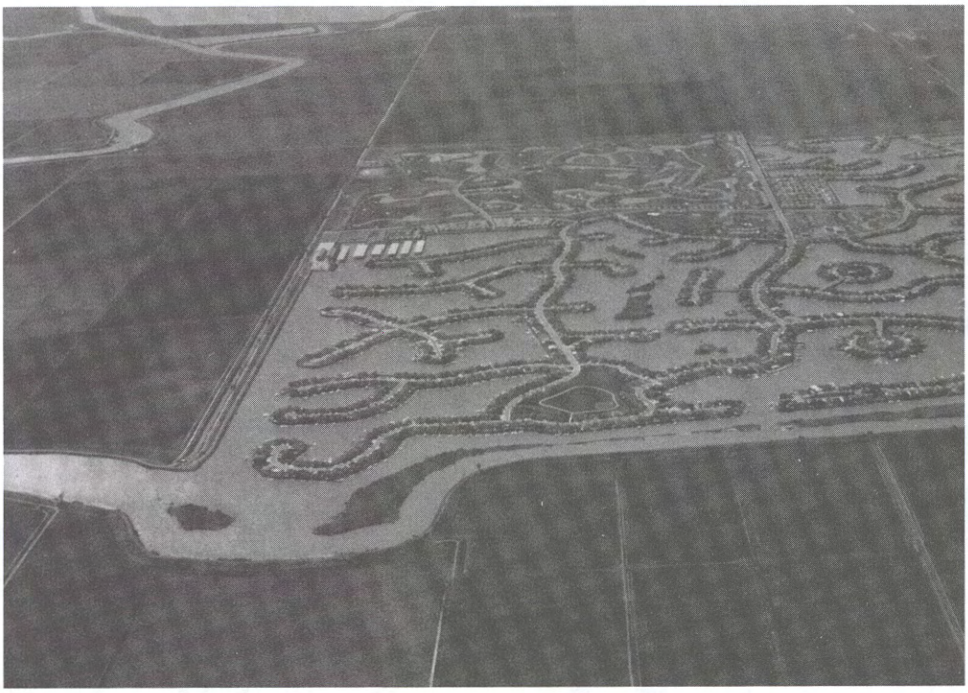
This aerial photograph shows islands within channels in the central and northern Delta. Channel islands provide high-quality wildlife habitat.



Population of Delta Communities

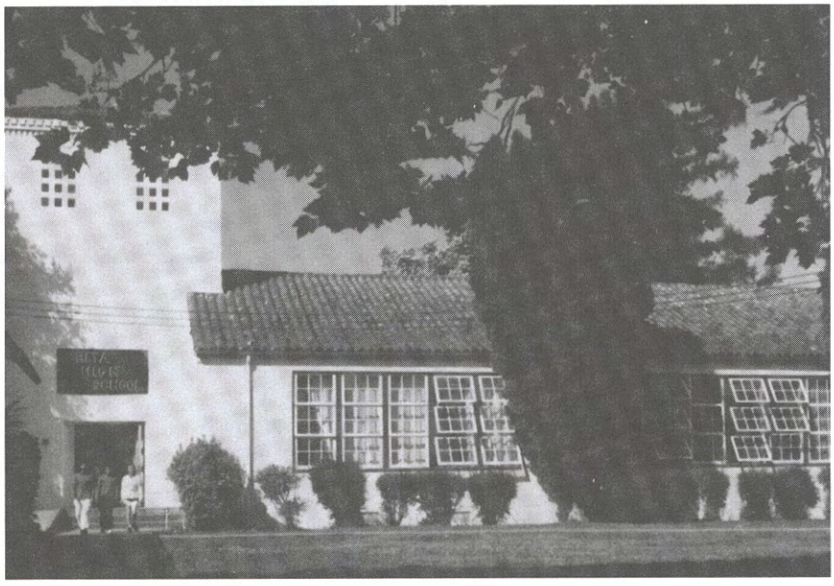
Delta Population

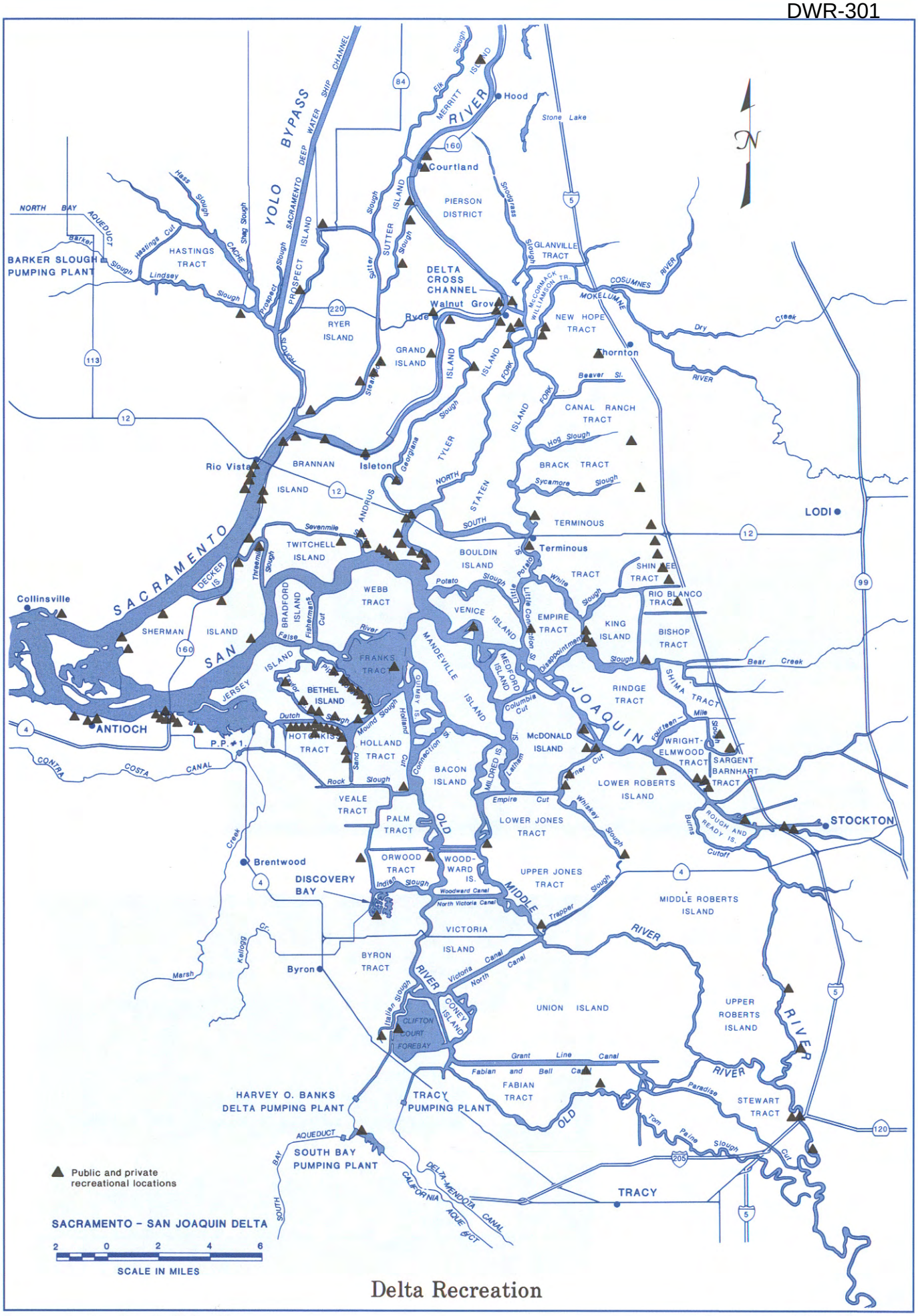
Most of the people living in the Delta are located in the uplands on the periphery of the Delta but there are significant populations on six islands — Andrus-Brannan, Bethel, Byron, Grand, Hotchkiss, and New Hope. The other islands are devoted almost entirely to agriculture. Stockton has the largest population within the Delta. Other major Delta cities are Rio Vista, Tracy, Antioch, Pittsburg, and Isleton. A significant portion of Sacramento's population also lives in the Delta. The map on the left shows the population (1990 U.S. Census) of most Delta communities. Tables 3, 4, and 5, beginning on page 85, contain more detailed information about community and island populations.



Discovery Bay is a recent development with water access to the Delta.

Delta High School in Clarksburg.



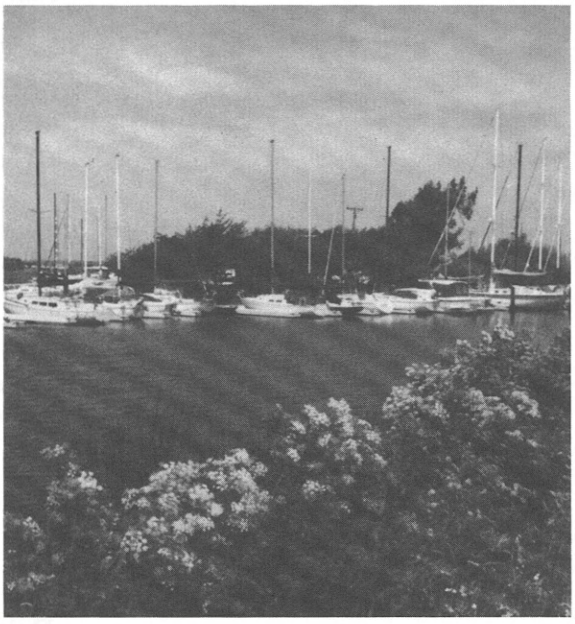


Delta Recreation

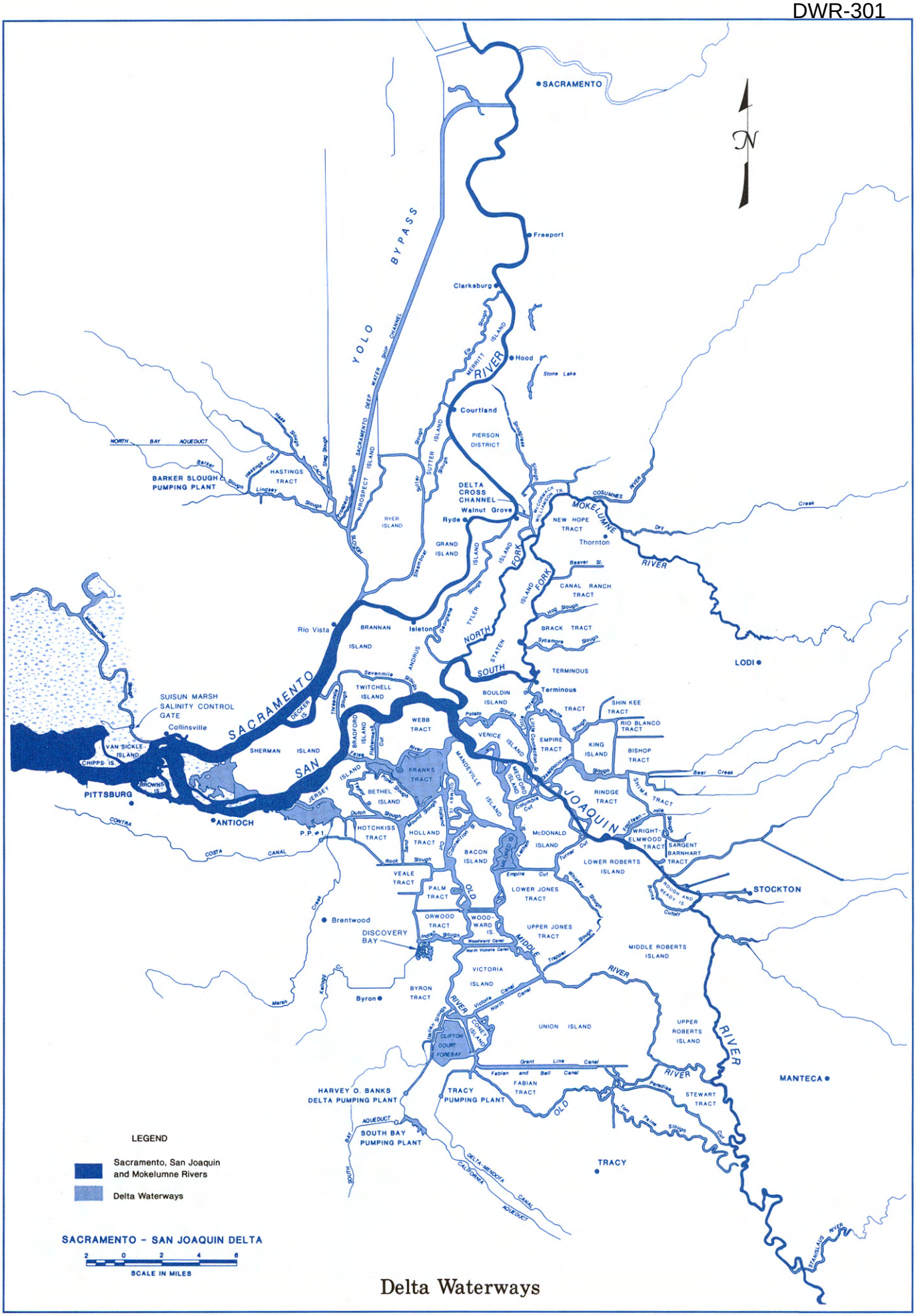
Delta Recreation

The Delta provides a variety of recreational opportunities for the public, including fishing, camping, and boating. It supports about 12 million user days a year. During the 1976-77 and 1987-92 droughts, when most reservoirs throughout the State were extremely low, the Delta provided the same water-based recreational opportunities as in other years. The map at left shows where the numerous recreational facilities can be found.

Sailboating in the Delta.



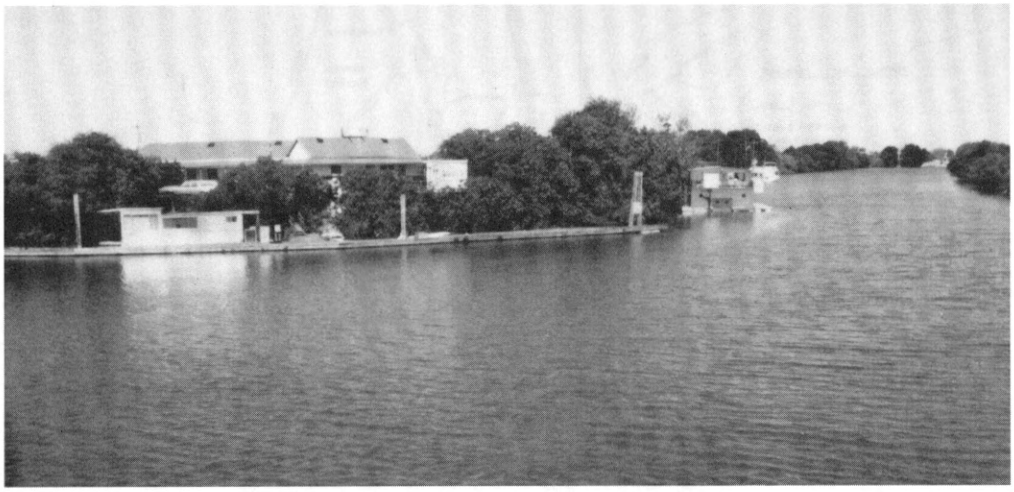
A marina in the Delta.



Delta Waterways

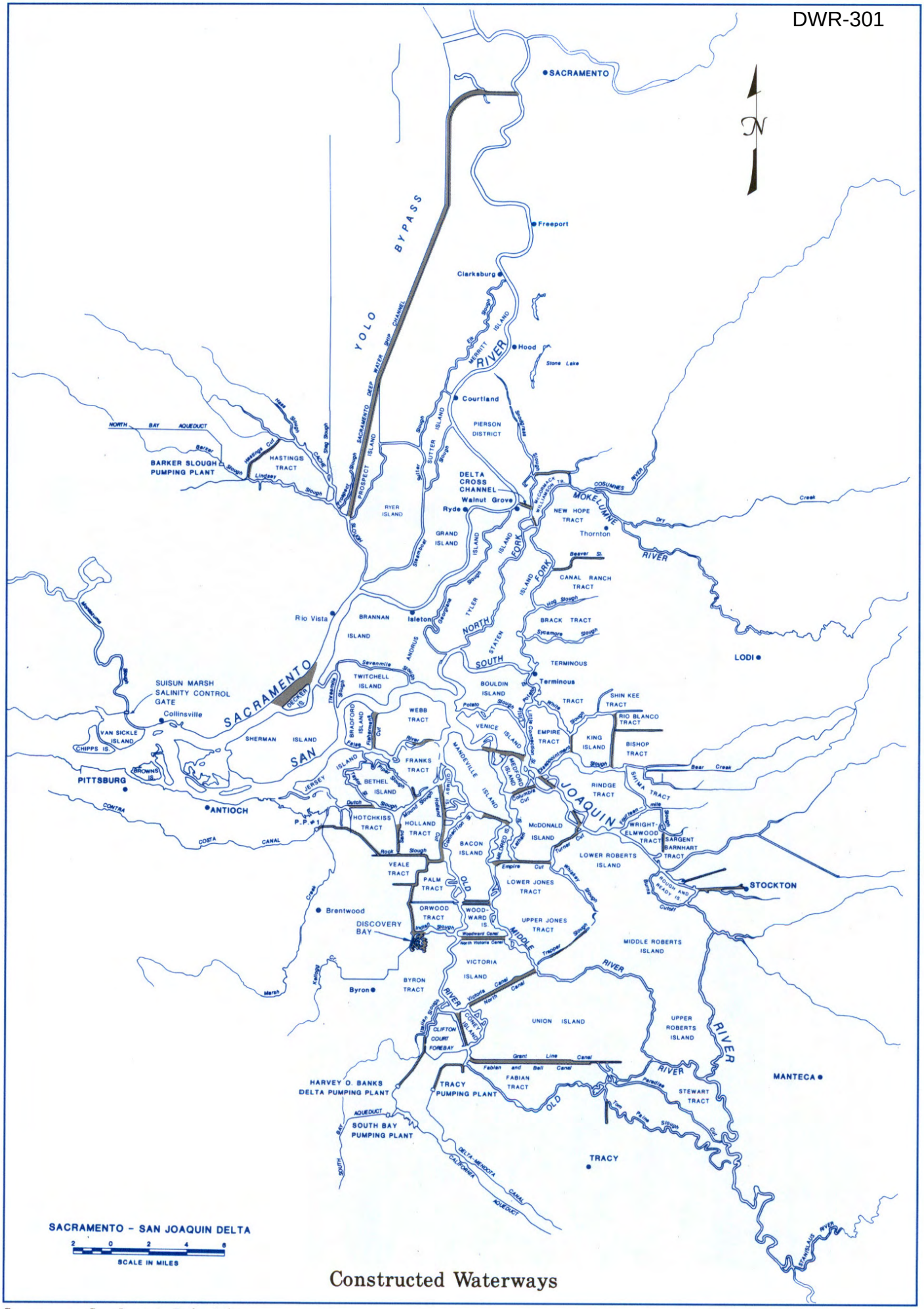
Delta Waterways

Delta waterways are the single most important geographical feature of the State's water resources system. Historically, over 40 percent of the State's runoff flowed to the Delta via the Sacramento, San Joaquin, and Mokelumne rivers. Many of the waterways follow natural courses while others have been constructed for specific purposes (see the following two sections). The map at left shows the location of the Sacramento, San Joaquin, and Mokelumne rivers within the mesh of Delta waterways.



Looking across the North Fork Mokelumne River from the northern tip of Staten Island toward Tyler Island.

Looking south on Old River east of Coney Island.


SACRAMENTO
N
YOLO BYPASS
Freeport
Clarksburg
Hood
Courtland
PIERSON DISTRICT
DELTA CROSS CHANNEL
Walnut Grove
Ryde
NEW HOPE TRACT
Thornton
MOKELUMNE RIVER
NORTH FORK
SOUTH FORK
CANAL RANCH TRACT
BRACK TRACT
TERMINOUS
Terminous
LODI
Rio Vista
BRANNAN ISLAND
Isleton
GRAND ISLAND
RYER ISLAND
PROSPECT ISLAND
SUTTER ISLAND
MERRITT ISLAND
NORTH BAY AQUEDUCT
BARKER SLOUGH PUMPING PLANT
HASTINGS TRACT
SUISUN MARSH SALINITY CONTROL GATE
Collinsville
SACRAMENTO
SAN JOAQUIN
VAN SICKLE ISLAND
CHIPPS IS.
BROWNS IS.
SHERMAN ISLAND
PITTSBURG
ANTIOCH
CONTRA COSTA CANAL
TWITCHELL ISLAND
BRADFORD ISLAND
WEBB TRACT
FRANKS TRACT
BETHEL ISLAND
HOTCHKISS TRACT
HOLLAND TRACT
VENICE ISLAND
EMPIRE TRACT
KING ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
BISHOP TRACT
MANDEVILLE ISLAND
MEDFORD ISLAND
RINDGE TRACT
SHIMA TRACT
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT-BARNHART TRACT
LOWER ROBERTS ISLAND
STOCKTON
ROBERTS AND READY IS.
BACON ISLAND
VEALE TRACT
PALM TRACT
LOWER JONES TRACT
ORWOOD TRACT
WOODWARD IS.
UPPER JONES TRACT
Brentwood
DISCOVERY BAY
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
BYRON TRACT
Byron
UNION ISLAND
UPPER ROBERTS ISLAND
CLIFTON COURT FOREBAY
CORRAL ISLAND
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
FABIAN TRACT
STEWART TRACT
MANTECA
SOUTH BAY AQUEDUCT
SOUTH BAY PUMPING PLANT
TRACY
DELTA-MENDOTA CANAL
OLD RIVER
MIDDLE RIVER
SACRAMENTO - SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Constructed Waterways

Constructed Waterways

Not all of the Delta waterways follow natural channels. Some were constructed for navigation, while others were constructed to provide water circulation or to obtain material for levee construction. The Delta Cross Channel, a Central Valley Project facility, links the Sacramento River with the Mokelumne River system to improve water circulation within the northern and central Delta. The map at left illustrates the location of all waterways constructed in the Delta.

Looking west at Woodward and North Victoria canals and at a segment of Middle River in the foreground.

The Delta Cross Channel, constructed by the Bureau of Reclamation in 1951, connects the Sacramento River (foreground) with Snodgrass Slough and the Mokelumne River system.

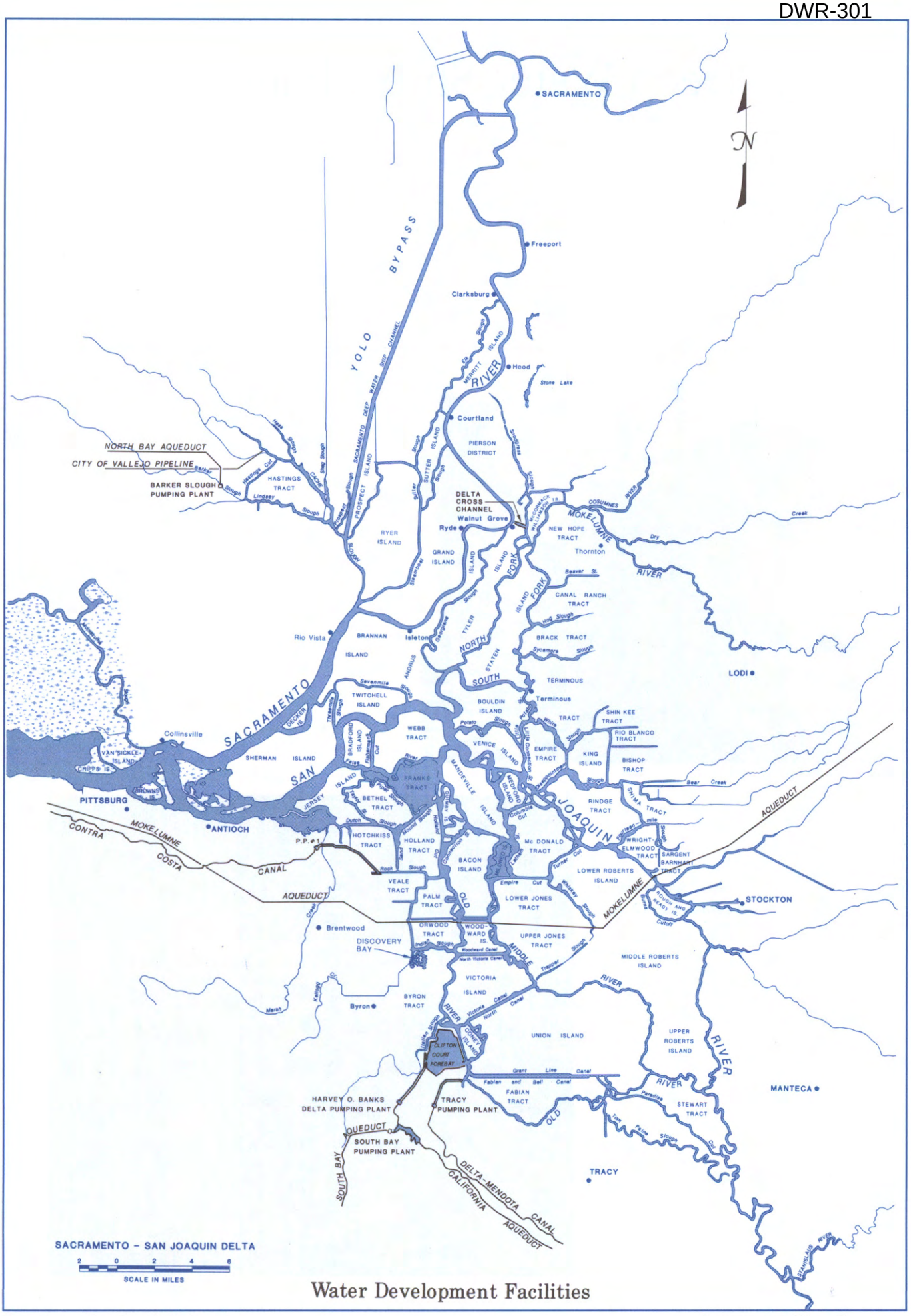
Deep Water Ship Channels

Deep Water Ship Channels

The Delta supports two major inland ports, one in Stockton and one in Sacramento. They are located about 80 nautical miles east of the Golden Gate Bridge. As shown on the map at left, they are served by the Stockton Deep Water Ship Channel, completed in 1933, and the Sacramento Deep Water Ship Channel, completed in 1963. These channels have recently been deepened to 35 feet.

A cargo ship at the Port of Stockton.

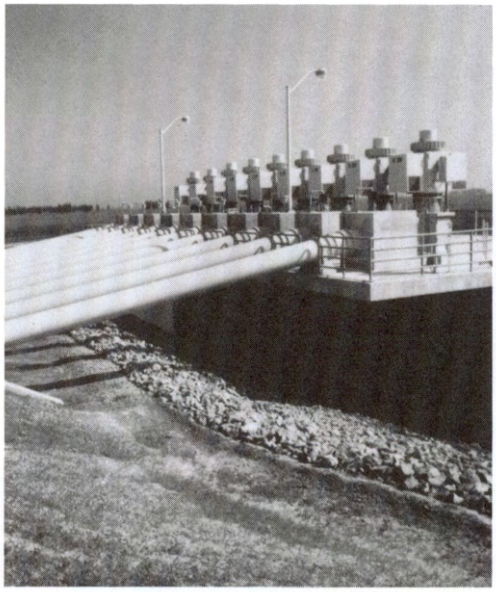
The Port of Sacramento on the Deep Water Ship Channel.



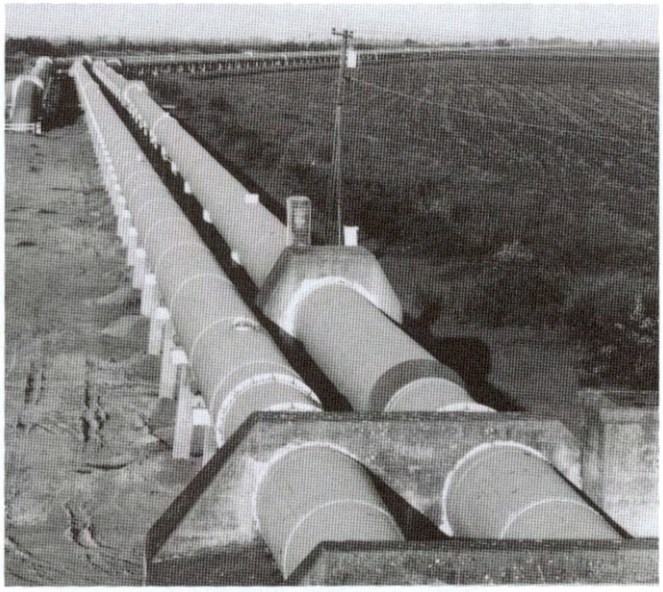
Water Development Facilities

Water Development Facilities

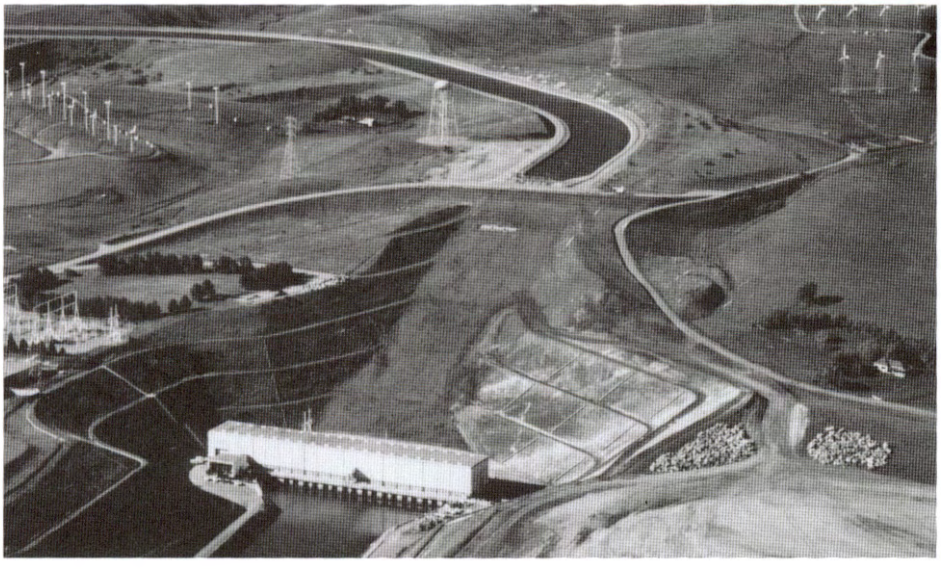
Many major water development facilities are dependent on Delta waterways and levees. As shown in the figure on the left, these include the California Aqueduct, the Harvey O. Banks Delta Pumping Plant, and the North and South Bay Aqueducts of the State Water Project. Major federal facilities are the Central Valley Project's Tracy Pumping Plant, Delta-Mendota Canal, and Contra Costa Canal. Also shown is the East Bay Municipal Utility District Aqueduct (pipeline) that crosses low-lying Delta islands and is protected by levees.



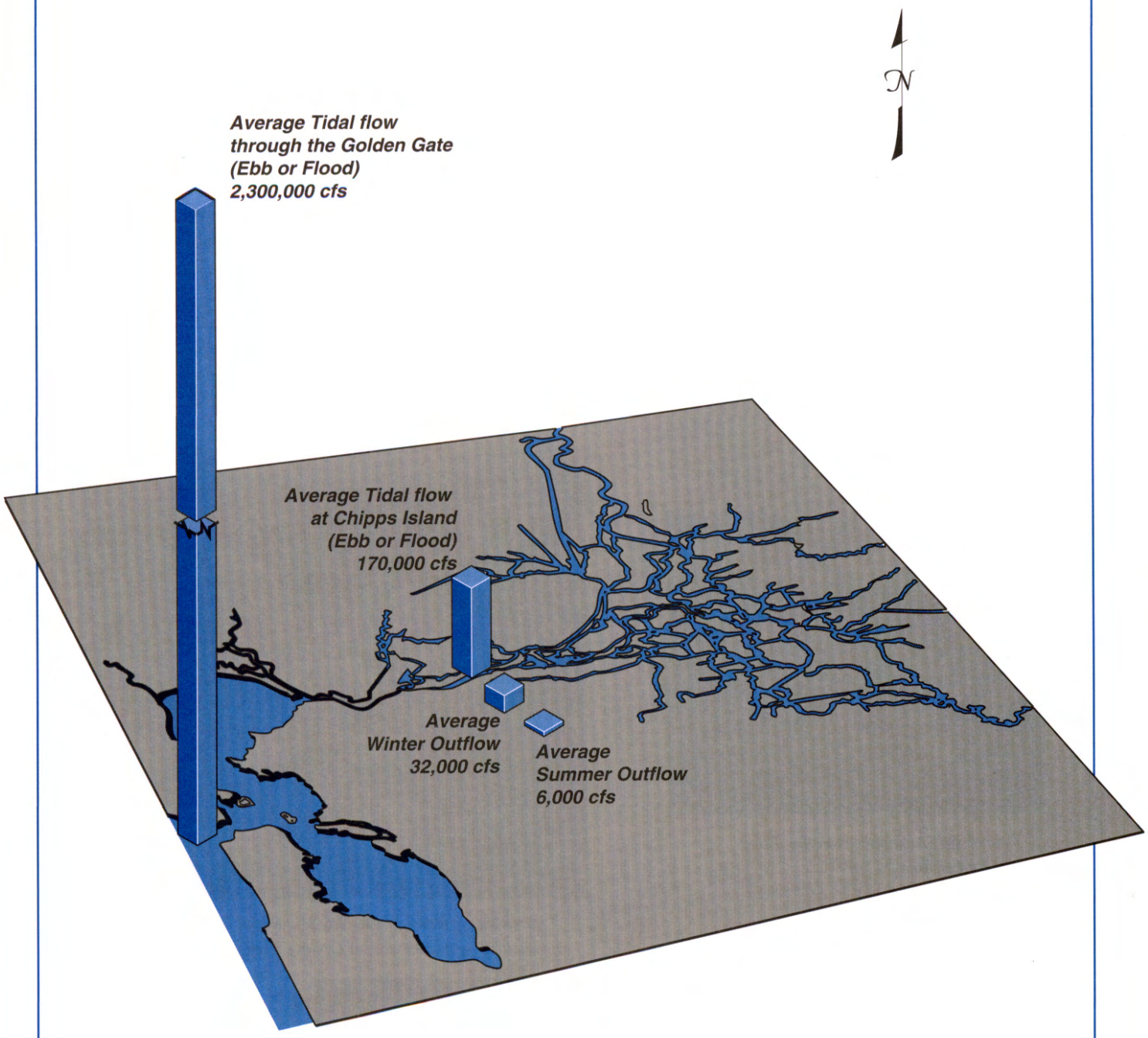
North Bay Aqueduct Pumping Plant at Barker Slough.



Looking west along East Bay Municipal Utility District Aqueduct west of Orwood Tract.



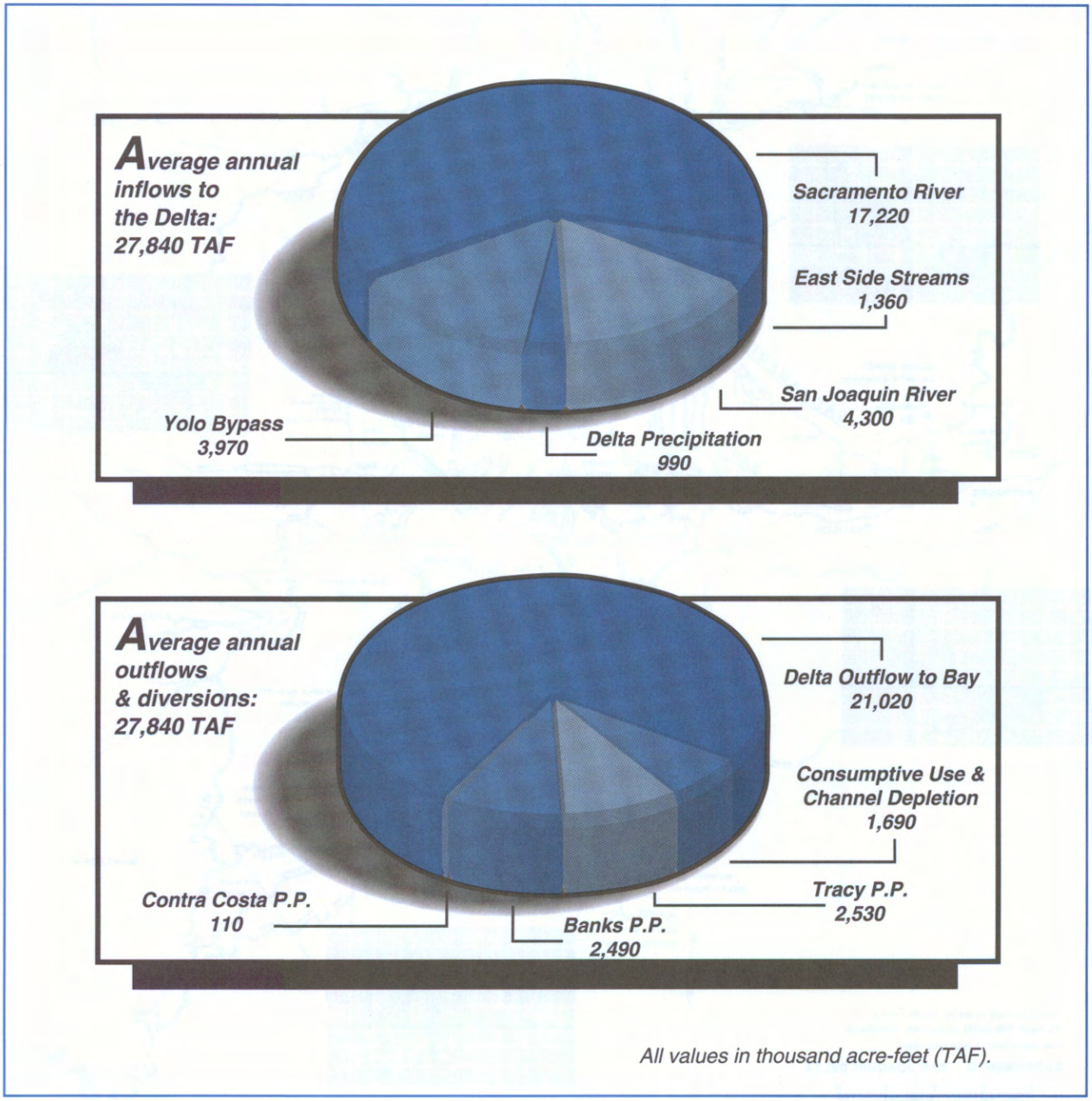
Aerial photo of Harvey O. Banks Delta Pumping Plant.

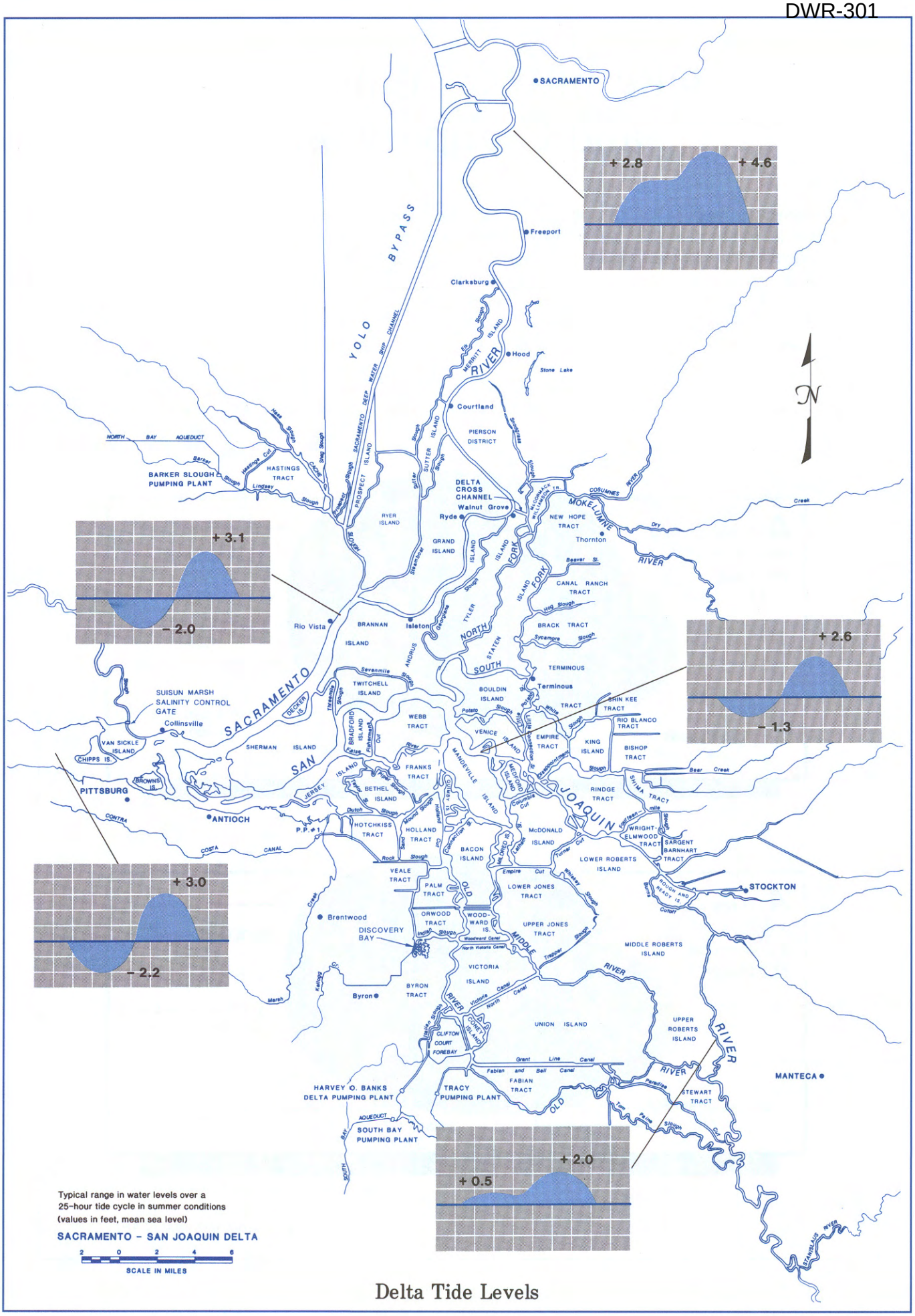


Comparison of Delta Outflow with Tidal Flows

Delta Flows Components and Comparisons

The major components of the Delta Water Supply are illustrated below along with the components which use this supply. These figures contain average annual values for the recent period of 1980 – 1991. The average annual inflow to the Delta is 27,840 thousand acre-feet (TAF) for this period with the Sacramento and San Joaquin rivers contributing over 75 percent. Average annual Delta water use also totals 27,840 TAF with outflow to San Francisco Bay being the major component. When Delta outflow is compared to the average tidal flow at the Golden Gate or Chipps Island, its magnitude diminishes greatly. The figure to the left illustrates this point. It compares average Delta outflows for winter and summer with average tidal flows at the Golden Gate and Chipps Island.

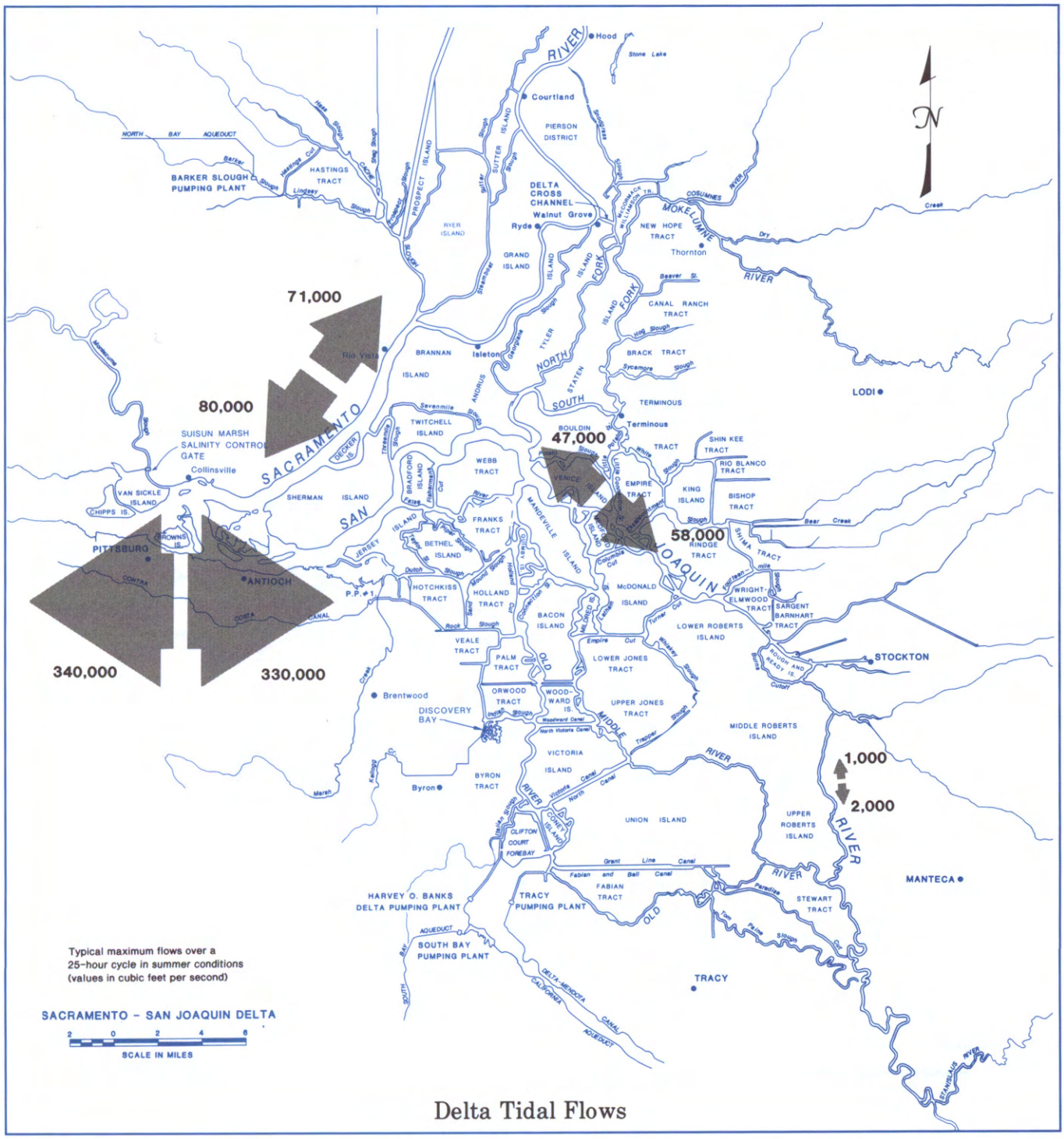




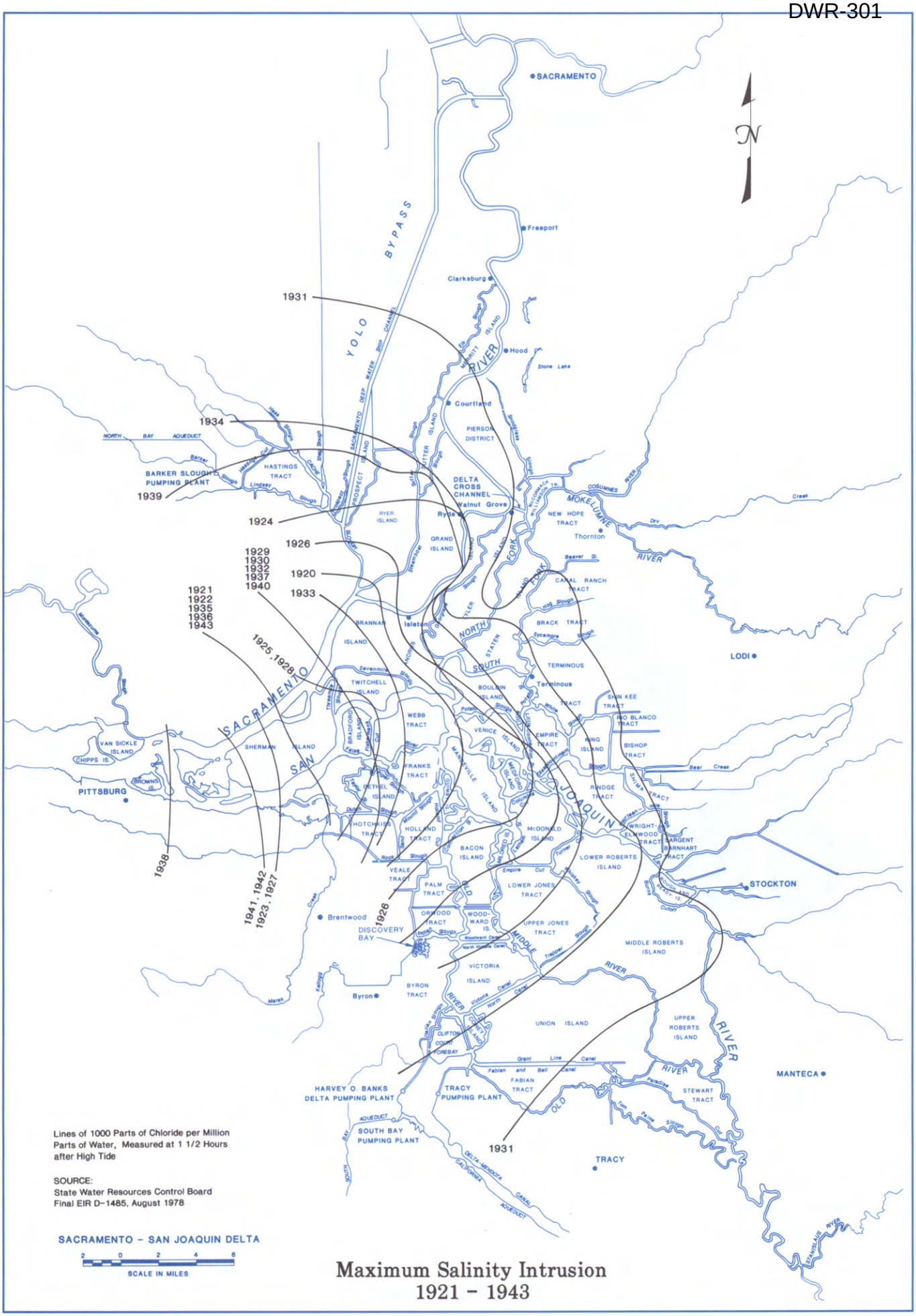
Delta Tide Levels

Delta Tidal Flows and Levels

The Sacramento-San Joaquin Delta is at sea level. Water levels vary greatly during each tidal cycle, from less than a foot on the San Joaquin River near Interstate 5 to more than five feet near Pittsburg. During the tidal cycle, flows can also vary in direction and amount. For example and as shown on the map below, the flow near Pittsburg during a typical summer tidal cycle can vary from 330,000 cfs upstream to 340,000 cfs downstream. The "net" summer Delta outflow is a very small amount of the total water movement, generally 5,000 to 10,000 cfs.



Delta Tidal Flows


SACRAMENTO
Freeport
Clarksburg
Hood
Courtland
Walnut Grove
Thornton
Isleton
Terminous
LODI
STOCKTON
MANTECA
TRACY
Brentwood
Byron
PITTSBURG
DISCOVERY BAY
1931
1934
1939
1924
1926
1929
1930
1932
1937
1940
1920
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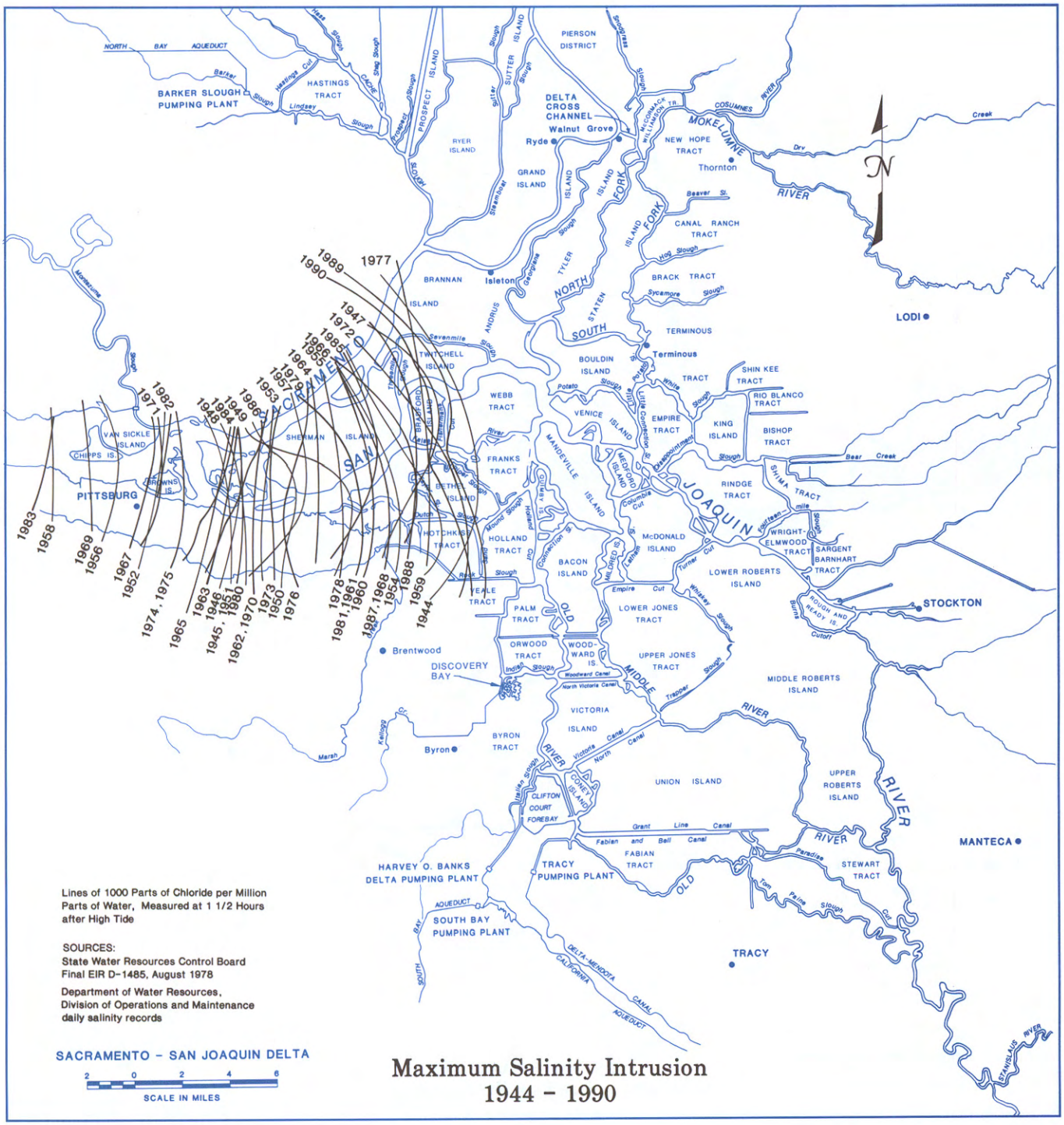
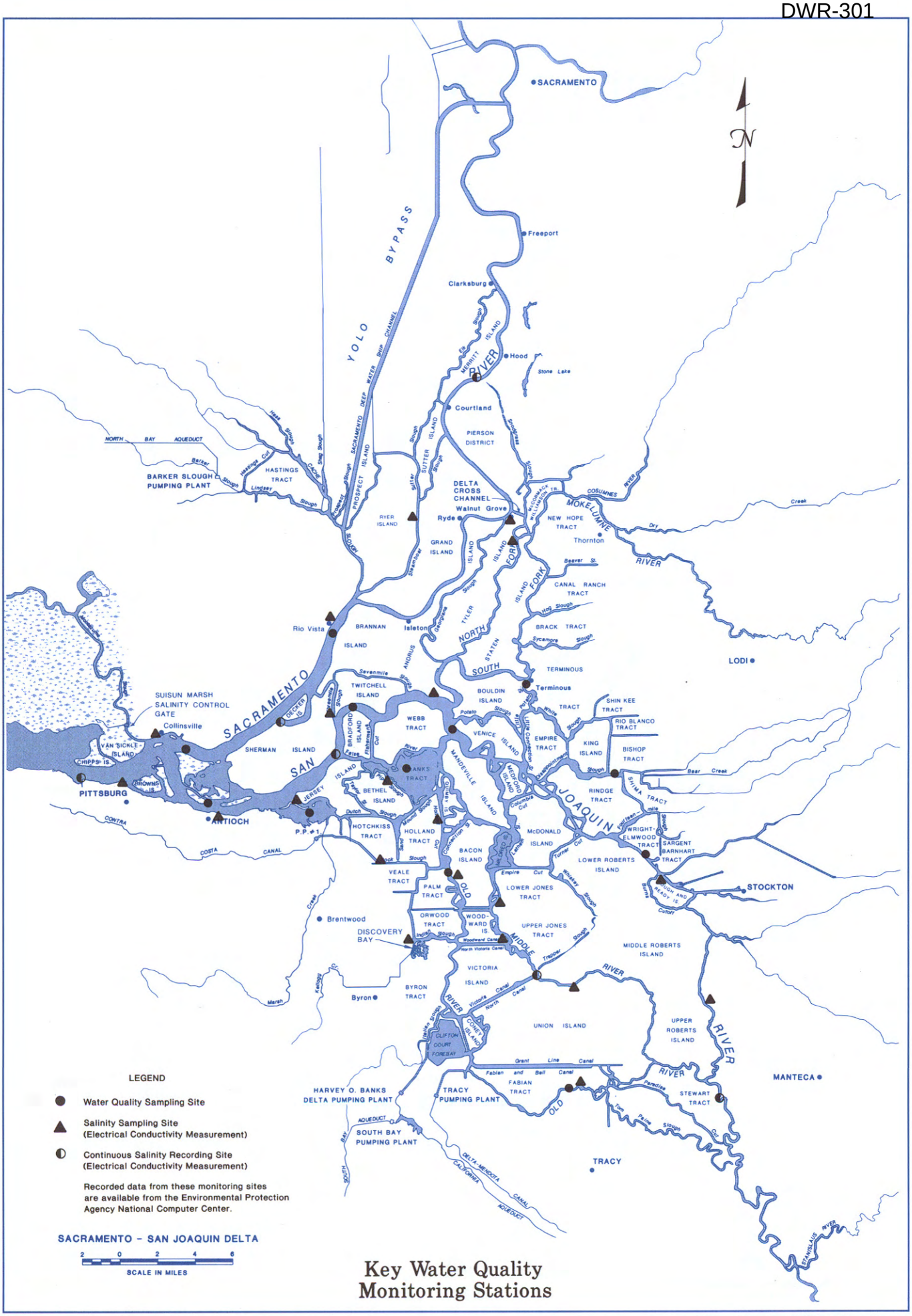
1921
1922
1935
1936
1943
1925, 1928
1938
1941, 1942
1923, 1927
1926
1931
SACRAMENTO RIVER
SAN JOAQUIN RIVER
YOLO BYPASS
OLD RIVER
MIDDLE RIVER
OLD RIVER
MOKELUMNE RIVER
NORTH FORK MOKELUMNE RIVER
DELTA CROSS CHANNEL
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
BARKER SLOUGH PUMPING PLANT
SOUTH BAY PUMPING PLANT
NORTH BAY AQUEDUCT
DELTA-MENDOTA CANAL
Grant Line Canal
Fabian and Bell Canal
Old River
Middle River
Victoria Canal
North Victoria Canal
Woodward Canal
Turner Cut
Threemile Slough
Sevenmile Slough
Potato Slough
Georgiana Slough
Steamboat Slough
Sutter Slough
Miner Slough
Cache Slough
Lindsey Slough
Barker Slough
Hastings Cut
Prospect Slough
Lindsey Slough
Ryer Island
Grand Island
Brannan Island
Twitchell Island
Sherman Island
Bradford Island
Webb Tract
Franks Tract
Bethel Island
Hotchkiss Tract
Holland Tract
Veale Tract
Palm Tract
Orwood Tract
Woodward Island
Bacon Island
McDonald Island
Lower Jones Tract
Upper Jones Tract
Victoria Island
Byron Tract
Union Island
Clifton Court Forebay
Middle Roberts Island
Upper Roberts Island
Lower Roberts Island
Stewart Tract
Fabian Tract
Empire Tract
Venice Island
Medford Island
Mandeville Island
Roberts Island
Peters Pocket
Shin Kee Tract
Rio Blanco Tract
King Island
Bishop Tract
Ridge Tract
Shima Tract
Wright-Elmwood Tract
Bargent Barnhart Tract
Canal Ranch Tract
Brack Tract
New Hope Tract
Pierson District
Stone Lake
Boulbin Island
Terminous Tract
Van Sickle Island
Chipps Is
Browns Is
Pittsburg
Marsh Creek
Kellogg Creek
Old River
Tom Paine Slough
Paradise Cut
Burns Cutoff
Bear Creek
Dry Creek
Beaver Slough
Mountain House
Lines of 1000 Parts of Chloride per Million Parts of Water, Measured at 1 1/2 Hours after High Tide
SOURCE:
State Water Resources Control Board
Final EIR D-1485, August 1978
SACRAMENTO – SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Maximum Salinity Intrusion
1921 – 1943

Maximum Salinity Intrusion

Tidal action and Delta outflow work to create a long and gradual salinity gradient from the Pacific Ocean into the Delta. Before Shasta Dam was built in 1943, the upper edge of this gradient (about 5 percent sea water) pushed far into the Delta in drier years. As shown on the map at left, salinity reached as far as Stockton on the San Joaquin River and to beyond Courtland on the Sacramento River in 1931. Today Shasta, Folsom, and Oroville reservoirs help control salinity intrusion by providing fresh water releases during the drier parts of the year as shown on the map below.





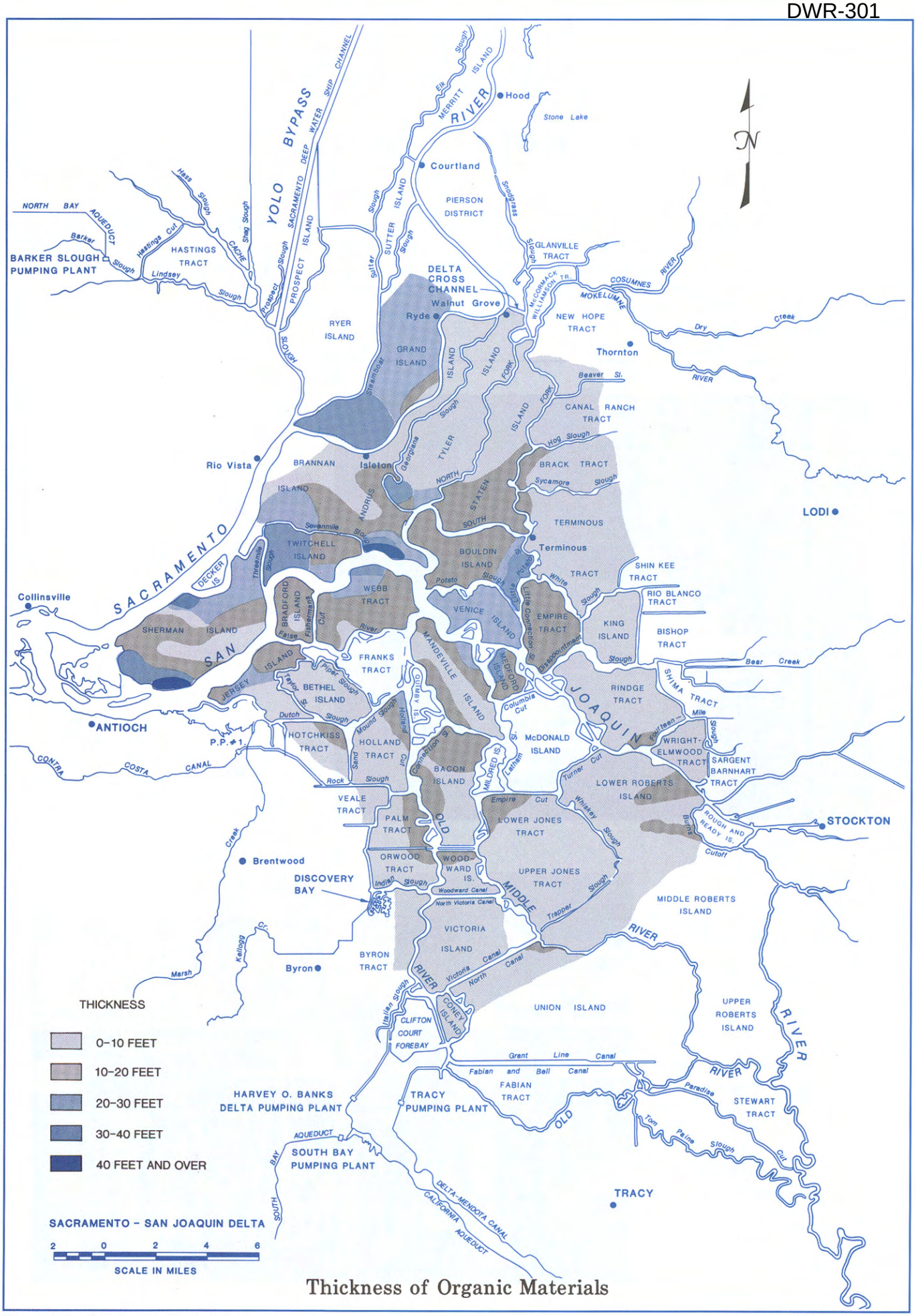
Key Water Quality Monitoring Stations

Key Water Quality Monitoring Stations

Using modern techniques, the Department of Water Resources conducts a comprehensive monitoring program throughout the Bay-Delta estuary, collecting data from more than 35 major water quality and biological monitoring sites (see map at left). These data are needed to operate the SWP and CVP within the water quality standards established by the State Water Resources Control Board, to provide a good base for establishing future standards, and for developing appropriate operating criteria for Delta facilities.

The San Carlos, a floating DWR laboratory, follows the tide to collect data at sampling stations throughout the Delta.

Fixed monitoring station at Rio Vista continuously monitors water level, salinity, temperature, dissolved oxygen, turbidity, and pH. It also measures wind speed and duration and solar radiation. It is one of over 35 stations in the Delta.

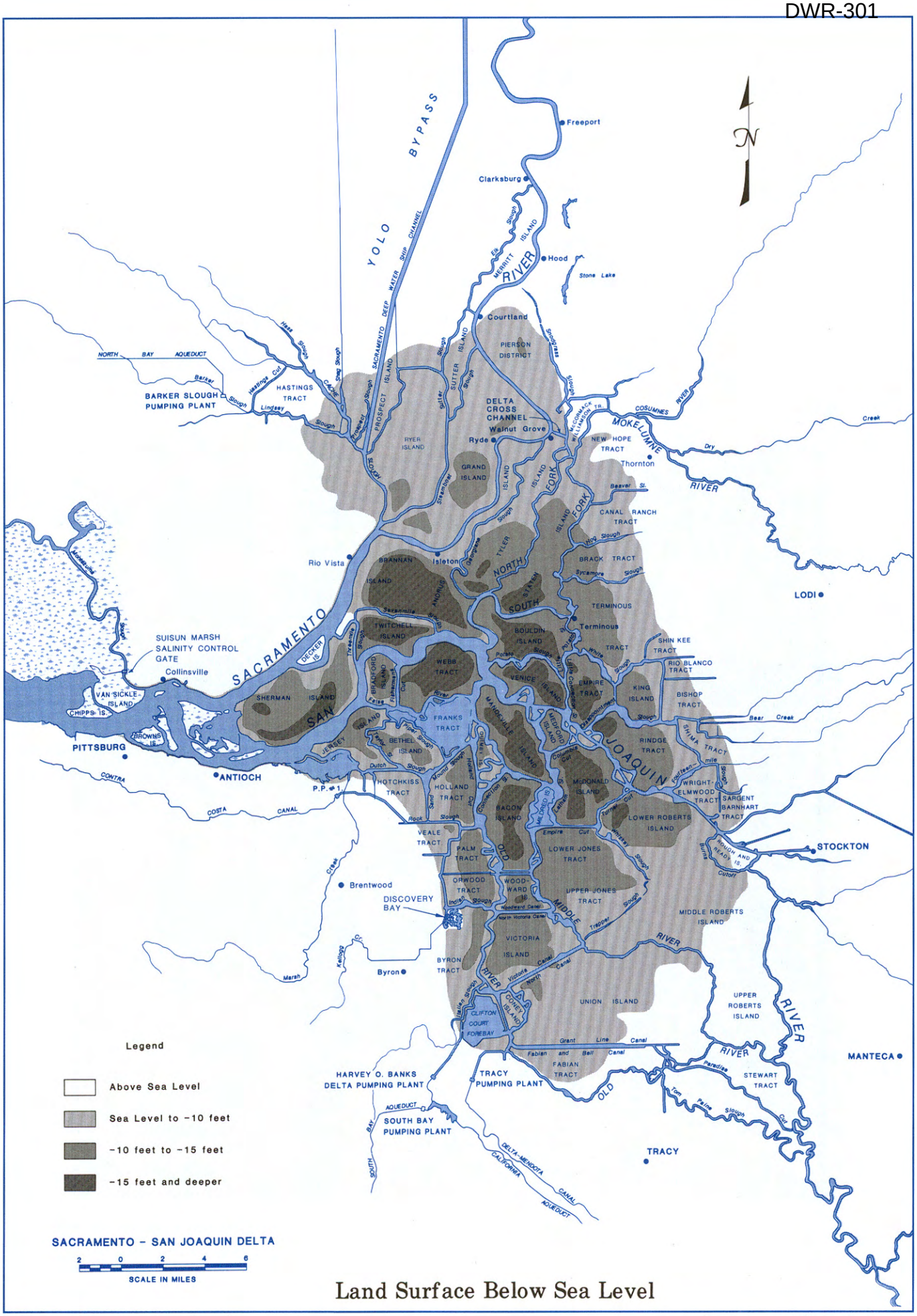


Thickness of Organic Materials

Thickness of Organic Materials

For millions of years, river flows and tidal action deposited sediment in the Delta, the low point of the Central Valley. Thick organic soil, commonly referred to as peat, was formed as tules and other plants were covered by this sediment throughout the years. These organic soils, up to 60 feet deep in some areas, were first farmed in the mid-1800s. Although highly productive for agriculture, peat is also very prone to subsidence (see the following section).

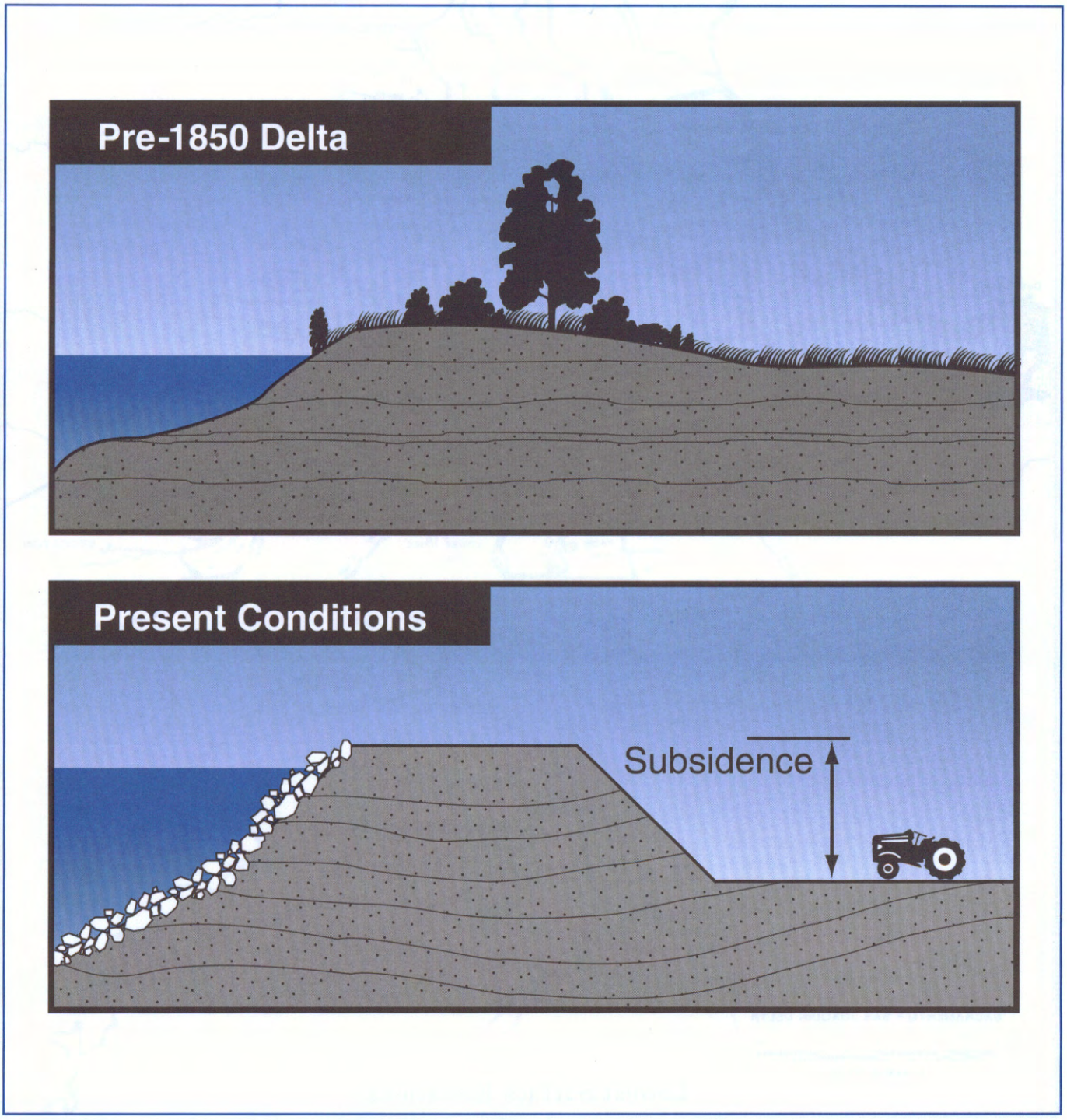
Farming on Sherman Island. Delta crops average a gross value of over $500 million per year.

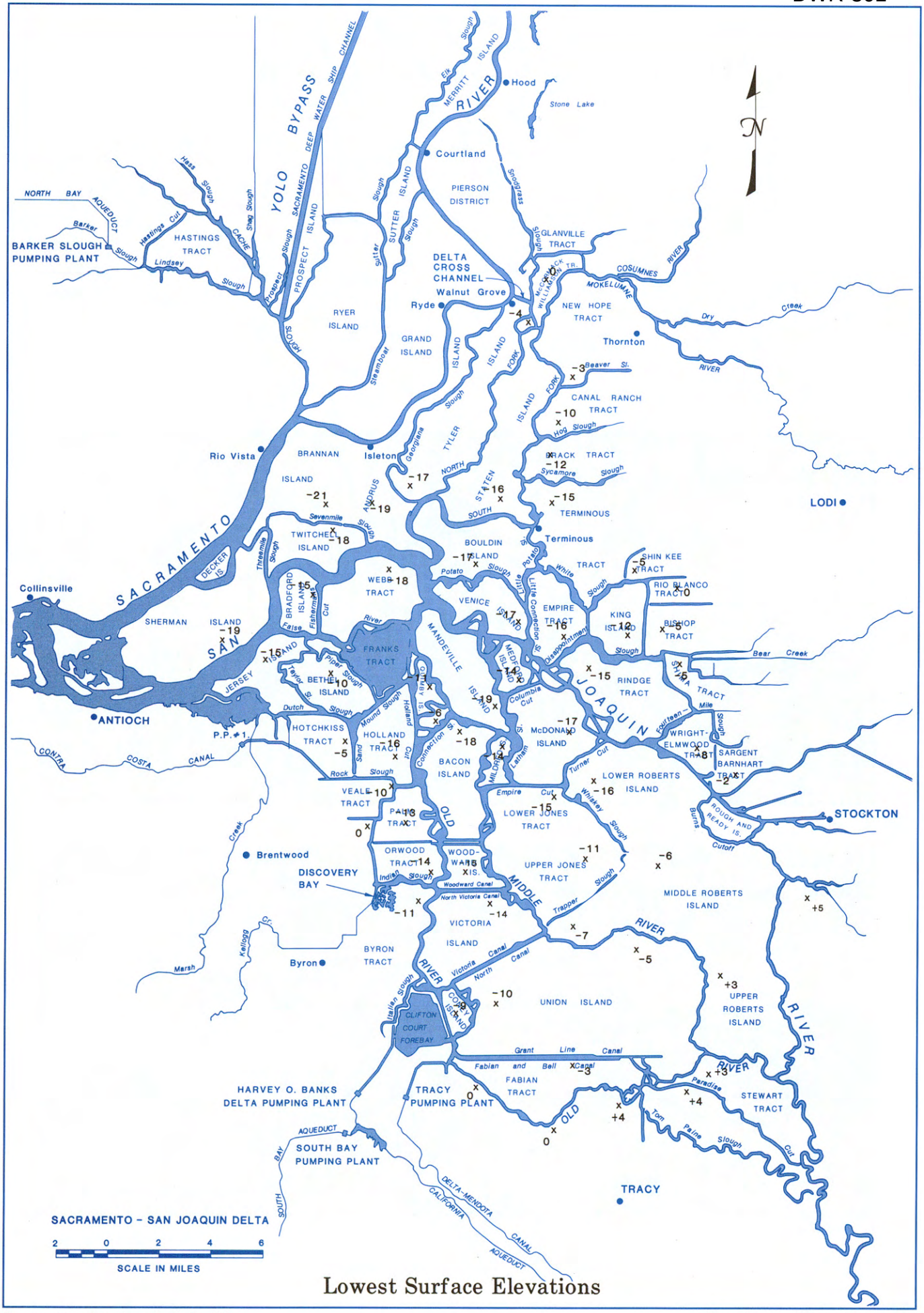


Land Surface Below Sea Level

Land Surface Below Sea Level

As shown in the figure to the left, some land in the central and western Delta is more than 15 feet below sea level. This situation is caused by land subsidence which is primarily the result of the loss of organic soil (peat). The loss is caused by exposure of peat to oxygen, which converts organic carbon solids to carbon dioxide and aqueous carbon. Subsidence is a major concern in the Delta because it increases the water pressure on levees and, therefore, the probability of levee failure and flooding.




N
Hood
Stone Lake
Courtland
PIERSON DISTRICT
GLANVILLE TRACT
DELTA CROSS CHANNEL
Walnut Grove
Ryde
NEW HOPE TRACT
Thornton
RYER ISLAND
GRAND ISLAND
CANAL RANCH TRACK TRACT
Rio Vista
BRANNAN ISLAND
Isleton
TERMINOUS
LODI
Terminous
TWITCHELL ISLAND
BOULDIN ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
Collinsville
SHERMAN ISLAND
WEBB TRACT
VENICE ISLAND
EMPIRE TRACT
KING ISLAND
BISHOP TRACT
FRANKS TRACT
MANDEVILLE ISLAND
MEDFORD ISLAND
RINDGE TRACT
SHIMA TRACT
BETHEL ISLAND
ANTIOCH
P.P. # 1
HOTCHKISS TRACT
HOLLAND TRACT
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
BACON ISLAND
LOWER ROBERTS ISLAND
VEALE TRACT
PALM TRACT
LOWER JONES TRACT
STOCKTON
Brentwood
ORWOOD TRACT
WOODWARD ISLAND
DISCOVERY BAY
UPPER JONES TRACT
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
Byron
BYRON TRACT
UNION ISLAND
UPPER ROBERTS ISLAND
CLIFTON COURT FOREBAY
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
FABIAN TRACT
STEWART TRACT
SOUTH BAY PUMPING PLANT
TRACY
BARKER SLOUGH PUMPING PLANT
SACRAMENTO - SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Lowest Surface Elevations

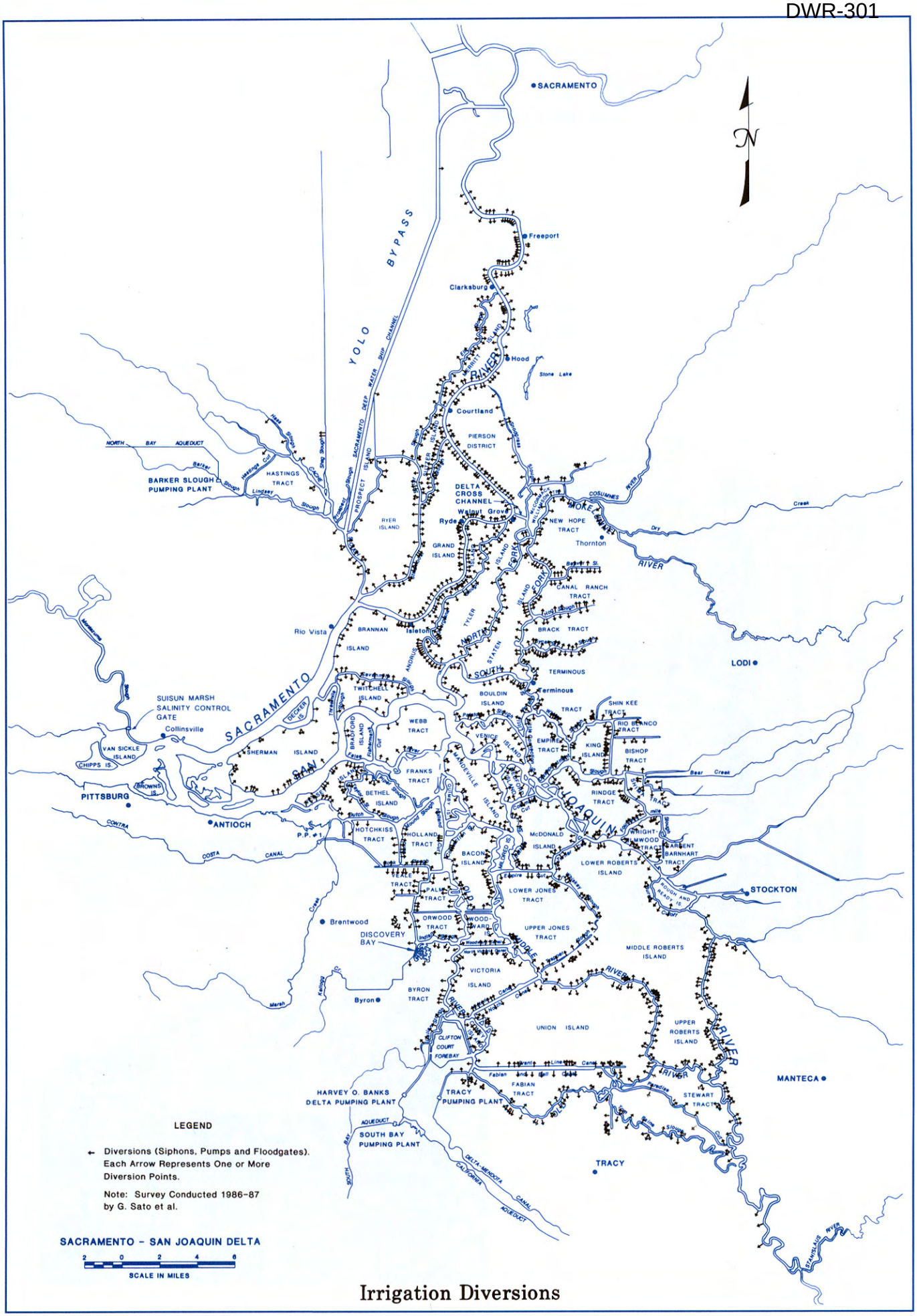
Lowest Surface Elevations

Today, in low-lying areas of the Delta, hundreds of miles of levees are needed to keep the land from being flooded by the surrounding water. The water surface can be over 20 feet higher than the land surface. As a result of this condition, a levee failure could result in flooding during the summer as well as the winter.

At least four levee failures have occurred during the summer or early fall — Webb Tract, June 1950; Andrus-Brannan Island, June 1972; Jones Tract, September-October 1980; and MacDonald Island, August 1982.

Cracks occurring on the levees of a low-lying island.

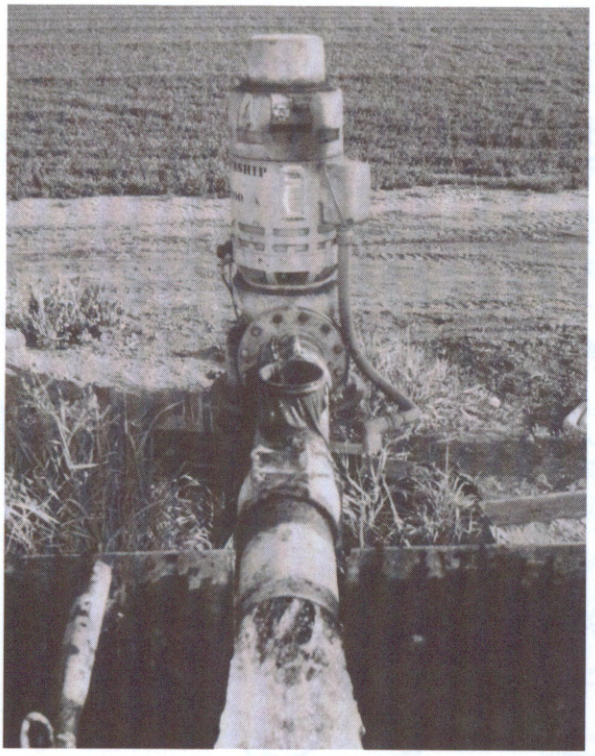
Land subsidence on Orwood Tract is exposing piles supporting the East Bay Municipal Utility District Aqueduct. These piles extend deep into the ground to assure continued stability.



Irrigation Diversions

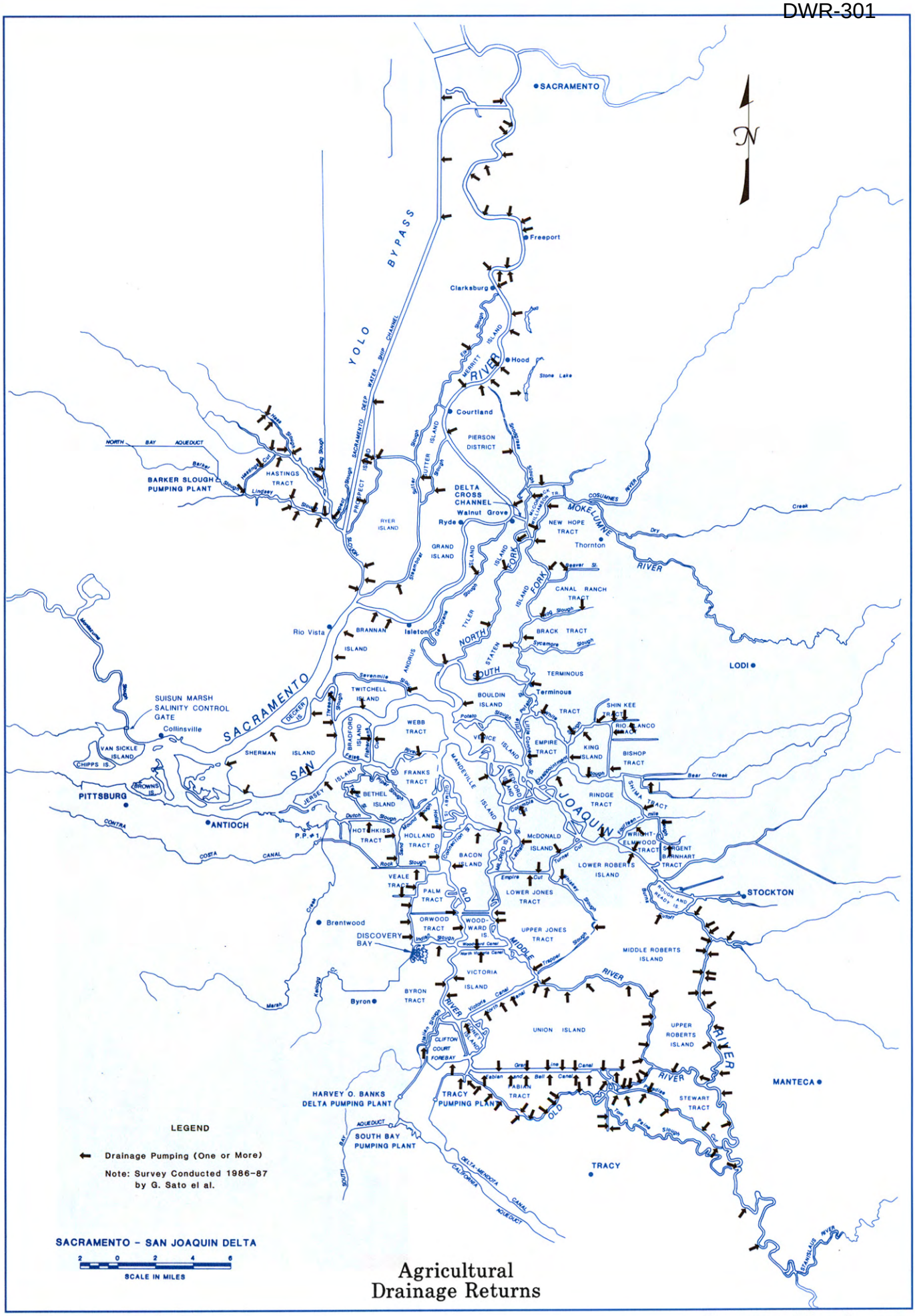
Irrigation Diversions

As shown on the map at left, there are about 1,800 agricultural diversions in the Delta. During the peak summer irrigation season, diversions from these facilities collectively exceed 4,000 cubic feet per second. Principal crops grown in the Delta are corn, grain, sugarbeets, alfalfa, pasture, tomatoes, asparagus, fruit, safflower, and nuts.



Typical agricultural diversion pump.

A siphon diverting water from the San Joaquin River to irrigate Sherman Island cropland.



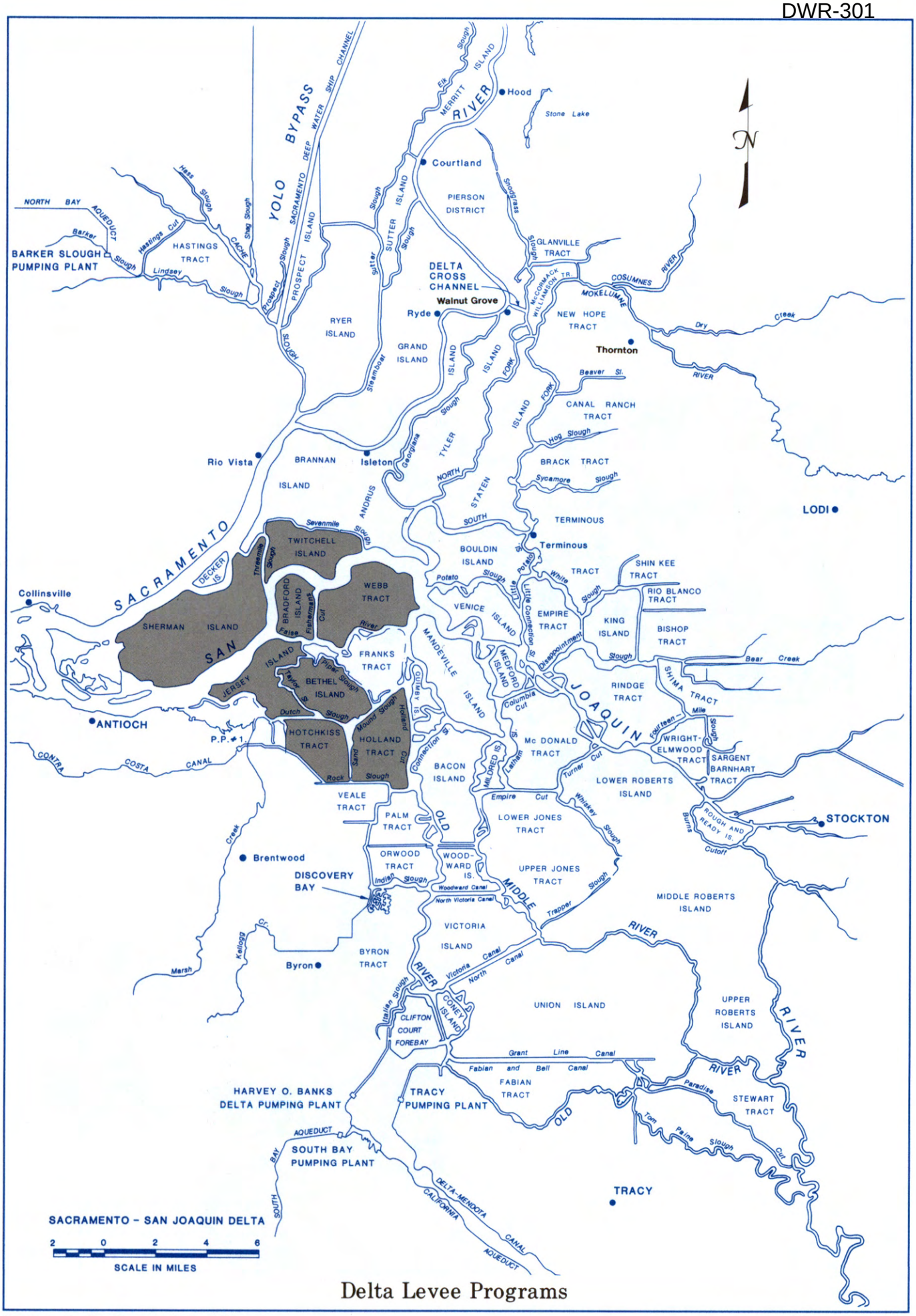
Agricultural Drainage Returns

Agricultural Drainage Returns

Irrigated plants will naturally evaporate pure water and leave the salts and minerals in the surrounding soil and water. This process results in agricultural drainage that is higher in salt and mineral concentration than the water initially applied to the crop. Most agricultural areas in the Delta are near or below sea level. Agricultural drainage water must be pumped from the low farmland over the levees into the nearby channel (see map at left). In some channels, this process degrades water quality.

Tomato field being irrigated.

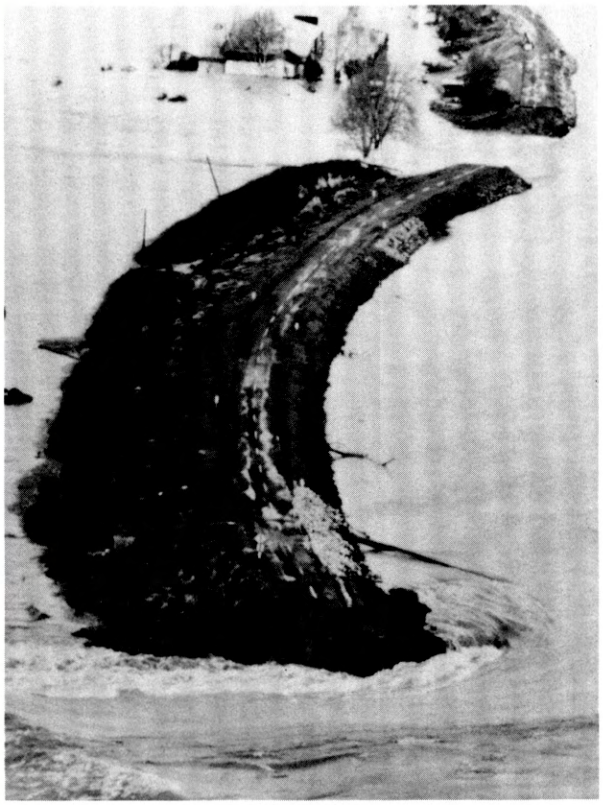
Agricultural drainage pipes on Twitchell Island. (The water is lifted approximately 20 feet to flow into the San Joaquin River.)



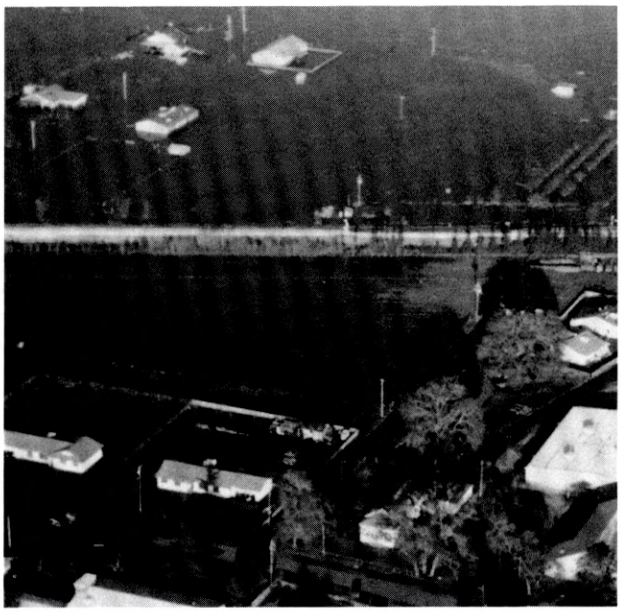
Delta Levee Programs

Delta Levee Programs

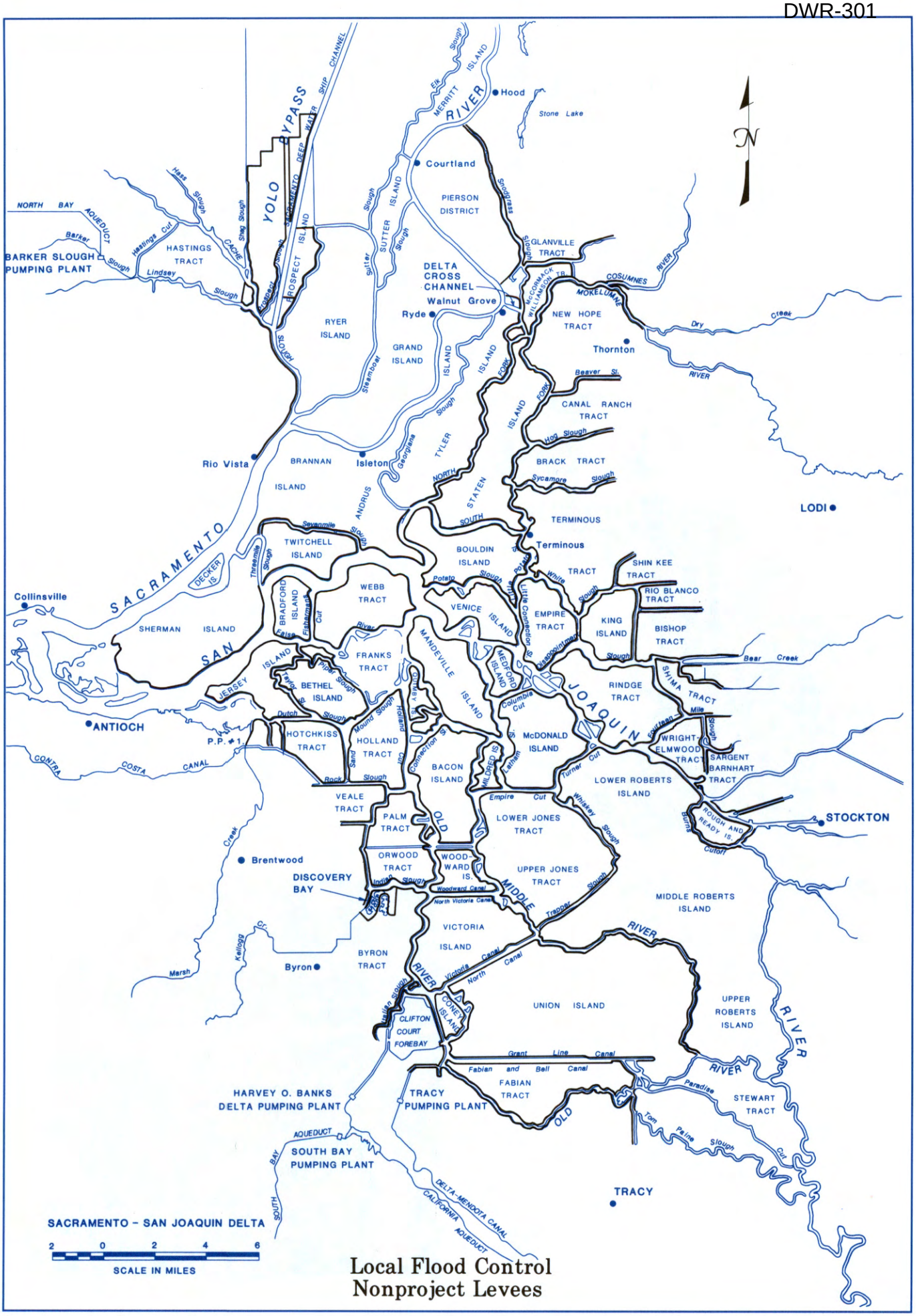
As a result of the serious flooding problems in 1986, the State Legislature passed the Delta Flood Protection Act of 1988 (SB 34). A portion of the Act provides for financial assistance for the communities of Walnut Grove and Thornton, and the eight islands of the west Delta shown on the adjacent map. These islands are critical to protecting Delta water quality because they are adjacent to major Delta channels in the area where fresh and salt waters mix. The Act also significantly increased monetary assistance to districts charged with the maintenance of local Delta levees via the Delta Levees Maintenance Subvention Program. In 1991, Senate Bill 1065 went into effect to assure that these flood protection activities result in no net loss of fish or wildlife habitat and to provide $3 million to mitigate past impacts.



1986 flooding of Tyler Island in the northern part of the Delta.



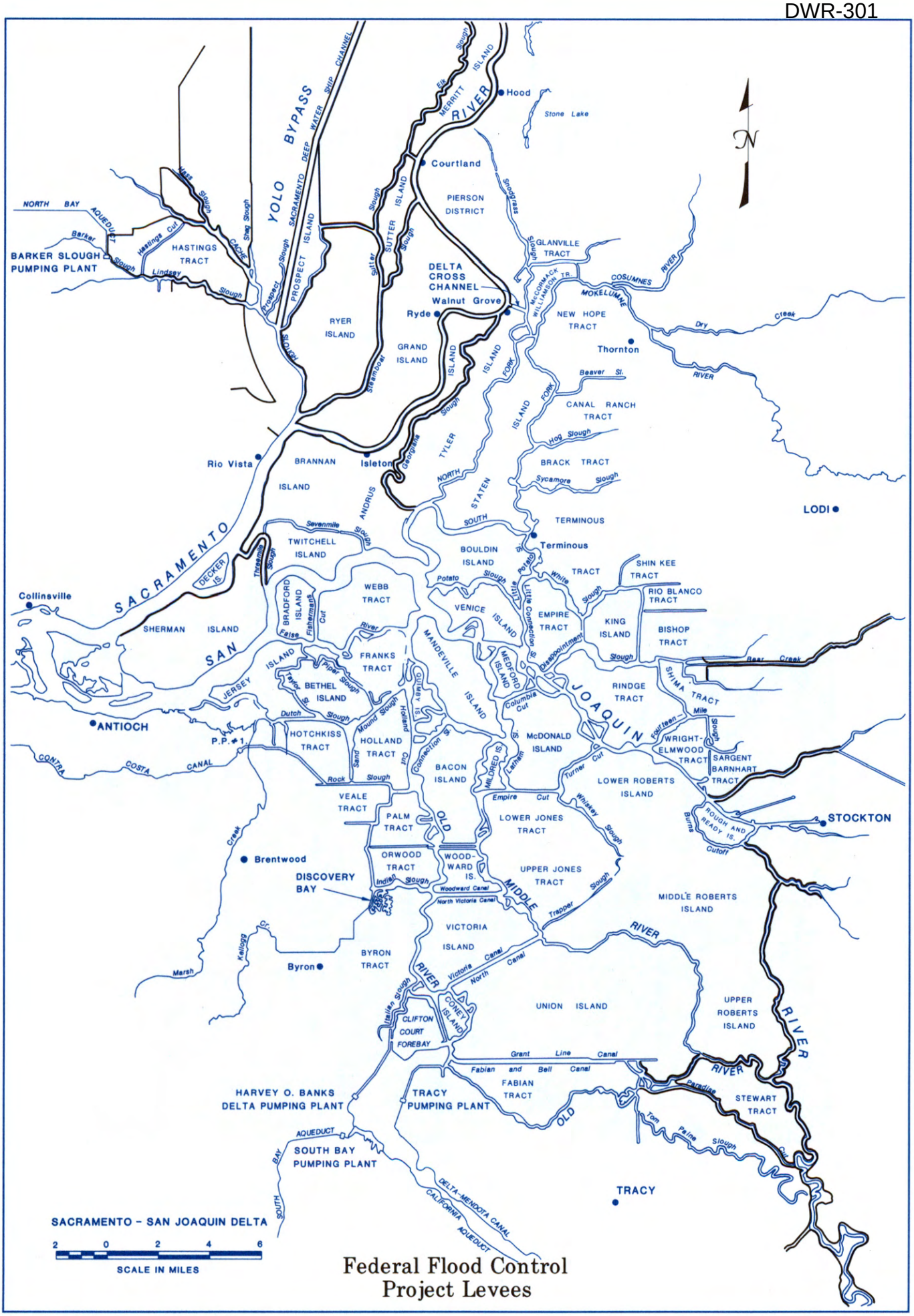
1986 flooding of the town of Thornton adjacent to the South Fork Mokelumne River.


SACRAMENTO – SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Local Flood Control
Nonproject Levees
N
YOLO BYPASS
SACRAMENTO RIVER
SAN JOAQUIN RIVER
MIDDLE RIVER
OLD RIVER
DELTA CROSS CHANNEL
NORTH BAY AQUEDUCT
BARKER SLOUGH PUMPING PLANT
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
DELTA-MENDOTA CANAL
CALIFORNIA AQUEDUCT
CONTRA COSTA CANAL
Rio Vista
Isleton
Courtland
Hood
Walnut Grove
Ryde
Thornton
Terminous
LODI
STOCKTON
TRACY
ANTIOCH
Brentwood
Collinsville
Byron
DISCOVERY BAY
P.P. #1
HASTINGS TRACT
RYER ISLAND
GRAND ISLAND
BRANNAN ISLAND
TWITCHELL ISLAND
SHERMAN ISLAND
DECKER IS.
WEBB TRACT
BRADFORD ISLAND
FRANKS TRACT
BETHEL ISLAND
HOTCHKISS TRACT
HOLLAND TRACT
VEALE TRACT
PALM TRACT
ORWOOD TRACT
BACON ISLAND
WOODWARD IS.
VICTORIA ISLAND
BYRON TRACT
CLIFTON COURT FOREBAY
PIERSON DISTRICT
GLANVILLE TRACT
NEW HOPE TRACT
CANAL RANCH TRACT
BRACK TRACT
TERMINOUS
BOULDIN ISLAND
VENICE ISLAND
EMPIRE TRACT
SHIN KEE TRACT
RIO BLANCO TRACT
KING ISLAND
BISHOP TRACT
MANDEVILLE ISLAND
MEDFORD ISLAND
RINDGE TRACT
SHIMA TRACT
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT-BARNHART TRACT
LOWER ROBERTS ISLAND
LOWER JONES TRACT
UPPER JONES TRACT
MIDDLE ROBERTS ISLAND
UNION ISLAND
CONE ISLAND
UPPER ROBERTS ISLAND
FABIAN TRACT
STEWART TRACT
ROUGH AND READY IS.
Hass Slough
Barker Slough
Lindsey Slough
Hastings Cut
Shag Slough
Prospect Slough
Sutter Slough
Steamboat Slough
Georgiana Slough
Snodgrass Slough
Elk Slough
Merritt Island
McCormack-Williamson Tr.
Mokelumne River
Dry Creek
Beaver Slough
Hog Slough
Sycamore Slough
Threemile Slough
Sevenmile Slough
Potato Slough
White Slough
Little Connection Slough
Disappointment Slough
Bear Creek
Mile Slough
Dutch Slough
Mound Slough
Sand Mound Slough
Rock Slough
Old River
Middle River
Connection Slough
Empire Cut
Turner Cut
Whiskey Slough
Trapper Slough
Woodward Canal
North Victoria Canal
Victoria Canal
North Canal
Grant Line Canal
Fabian and Bell Canal
Paradise Cut
Tom Paine Slough
Kellogg Cr.
Marsh Creek
Indian Slough
Old River
Middle River
Columbia Cut
Lancha Plain Cut
Mildred Island
Stone Lake

Local Flood Control Nonproject Levees

Most of the Delta lowlands are protected by nonproject levees as shown on the map at left. "Nonproject" distinguishes these levees from those that are part of federal flood control projects (see the following section). Improvement and maintenance of nonproject levees is very challenging because of poor foundations and regulations to protect levee wildlife habitat. Local districts responsible for maintaining these levees are reimbursed for a portion of the costs under the Delta Levees Subvention Program established in 1973. The Delta Flood Protection Act of 1988 significantly increased reimbursement opportunities but also added a major environmental mandate to ensure no net long-term loss of habitat. The boundaries of these maintenance districts are shown on the map on page 44.

Eroded nonproject levee protecting hundreds of acres of agricultural land and wildlife habitat.


N
SACRAMENTO - SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Federal Flood Control
Project Levees
Hood
Courtland
Walnut Grove
Ryde
Rio Vista
Isleton
Thornton
Terminous
LODI
Collinsville
ANTIOCH
Brentwood
Byron
Tracy
STOCKTON
DISCOVERY BAY
BARKER SLOUGH PUMPING PLANT
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
DELTA CROSS CHANNEL
SACRAMENTO
SAN JOAQUIN
YOLO BYPASS
MIDDLE RIVER
OLD RIVER
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DELTA-MENDOTA CANAL
CALIFORNIA AQUEDUCT
NORTH BAY AQUEDUCT
SHERMAN ISLAND
BRANNAN ISLAND
TWITCHELL ISLAND
RYER ISLAND
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WEBB TRACT
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BETHEL ISLAND
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VEALE TRACT
PALM TRACT
ORWOOD TRACT
WOODWARD IS.
VICTORIA ISLAND
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CLIFTON COURT FOREBAY
UNION ISLAND
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RIO BLANCO TRACT
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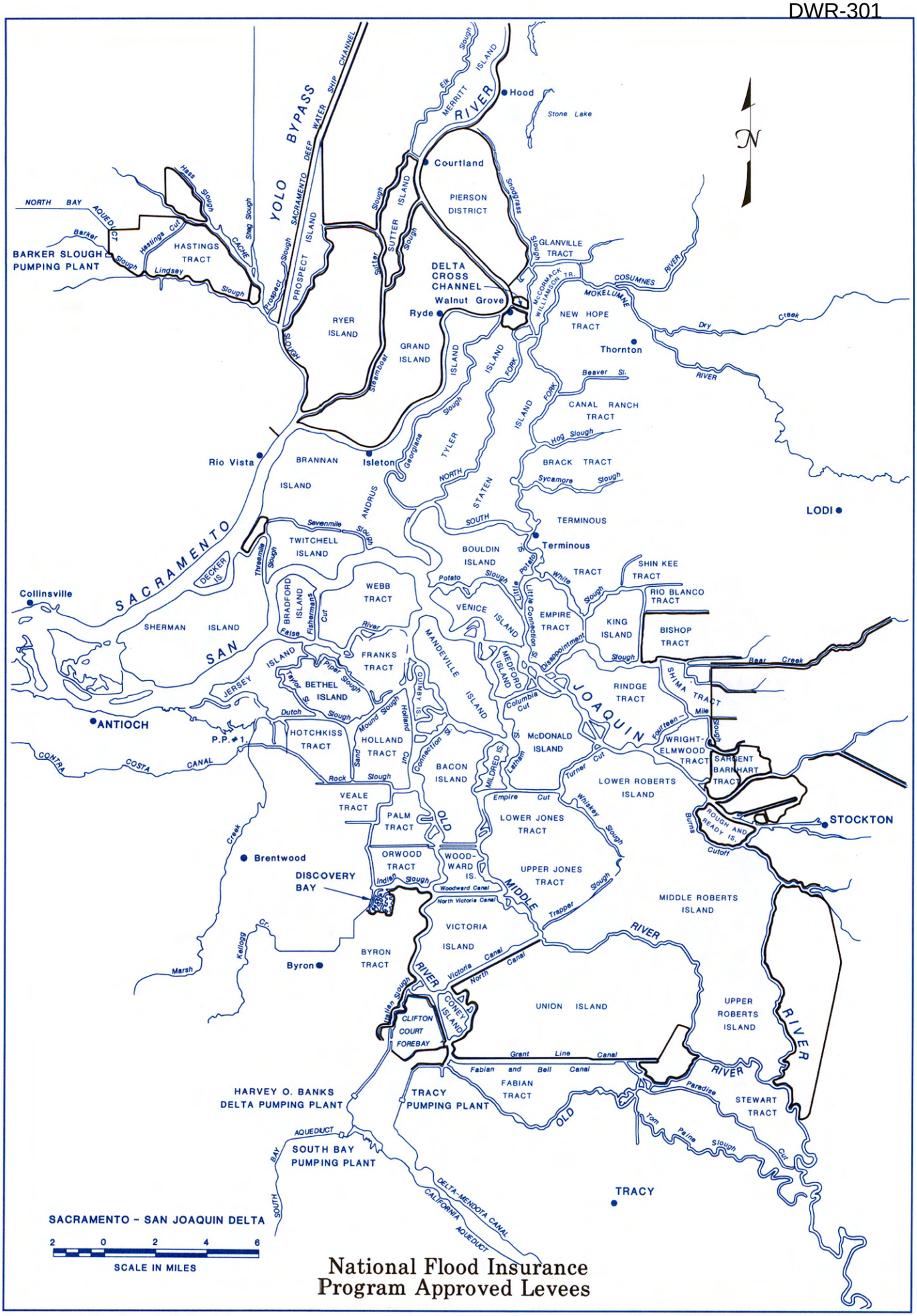
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
McDONALD ISLAND
LOWER ROBERTS ISLAND
MIDDLE ROBERTS ISLAND
UPPER ROBERTS ISLAND
LOWER JONES TRACT
UPPER JONES TRACT
STEWART TRACT
GLANVILLE TRACT
NEW HOPE TRACT
CANAL RANCH TRACT
BRACK TRACT
PIERSON DISTRICT
HASTINGS TRACT
BRADFORD ISLAND
MANDEVILLE ISLAND
MEDFORD ISLAND
TYLER ISLAND
ANDRUS ISLAND
DECKER IS.
CONEY ISLAND
MILDRED IS.
BARNHART IS.
OLIVERY IS.
CONNECTION IS.
ROUGH AND READY IS.
Stone Lake
Snodgrass Slough
Georgiana Slough
Steamboat Slough
Sutter Slough
Prospect Slough
Shag Slough
Lindsey Slough
Barker Slough
Hastings Cut
Miner Slough
Potato Slough
White Slough
Little Connection Slough
Disappointment Slough
Bear Creek
Dry Creek
Beaver Slough
Hog Slough
Sycamore Slough
Sevenmile Slough
Threemile Slough
False River
Fisherman's Cut
Taylor Slough
Dutch Slough
Mound Slough
Sand Creek
Rock Slough
Empire Cut
Turner Cut
Columbia Cut
Whiskey Slough
Trapper Slough
Woodward Canal
North Victoria Canal
Victoria Canal
Indian Slough
Kellogg Cr.
Marsh Creek
Italian Slough
Grant Line Canal
Fabian and Bell Canal
Old River
Paradise Cut
Tom Paine Slough
Burns Cutoff
Fourteen Mile Slough
McCormack Williamson Tr.
Columbia Cut
Lost Slough
Prospect Slough
Deep Water Ship Channel
Sacramento River
Merritt Island
Sutter Island
Prospect Island
Grand Island
Fork
North
South
Mokelumne River
Cosumnes River

Federal Flood Control Project Levees

In 1880, the State Engineer designed a flood control plan for the Sacramento Valley. This plan included a system of levees and bypasses for transporting floodwaters away from protected areas. In 1917 Congress authorized the Sacramento Flood Control Project, which was completed by the U. S. Army Corps of Engineers in 1960. Storage reservoirs and similar protective measures have been provided on the San Joaquin River. As shown on the map at left, these systems, denoted "project levees" to distinguish them from other levees, provide effective flood control for a portion of the Delta.

Experimental levee maintenance programs are being conducted at various locations in the Delta to determine better ways to protect the environment while maintaining proper safety for flood control. This photo shows a project to develop a berm that will provide for environmentally important shaded aquatic habitat.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Courtland
PIERSON DISTRICT
GLANVILLE TRACT
DELTA CROSS CHANNEL
Walnut Grove
Ryde
RYER ISLAND
GRAND ISLAND
NEW HOPE TRACT
Thornton
CANAL RANCH TRACT
BRACK TRACT
TERMINOUS
Terminous
LODI
Rio Vista
BRANNAN ISLAND
Isleton
TWITCHELL ISLAND
BOULDIN ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
BISHOP TRACT
Collinsville
SHERMAN ISLAND
WEBB TRACT
VENICE ISLAND
EMPIRE TRACT
KING ISLAND
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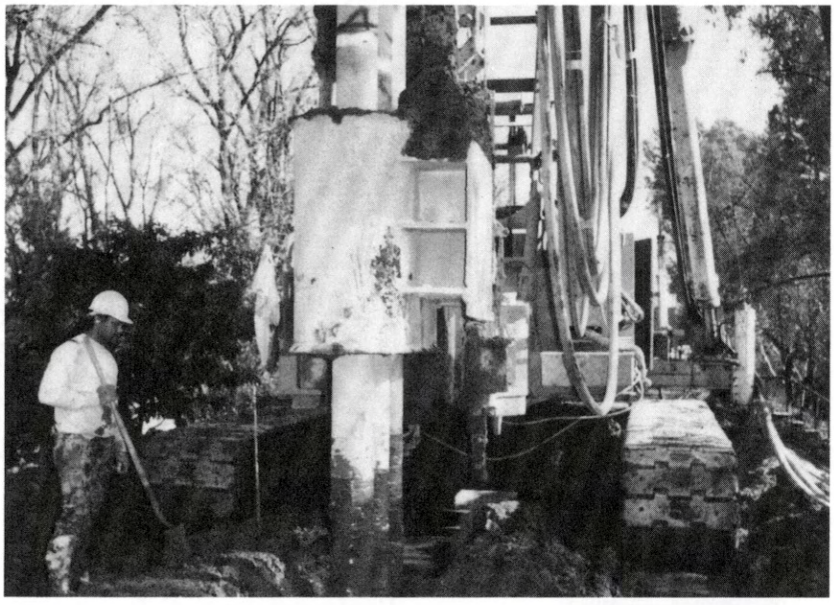
MEDFORD ISLAND
RINDGE TRACT
SHIMA TRACT
BETHEL ISLAND
ANTIOCH
P.P.#1
HOTCHKISS TRACT
HOLLAND TRACT
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
BACON ISLAND
LOWER ROBERTS ISLAND
VEALE TRACT
PALM TRACT
LOWER JONES TRACT
STOCKTON
ROUGH AND READY IS.
Brentwood
DISCOVERY BAY
ORWOOD TRACT
WOODWARD IS.
UPPER JONES TRACT
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
BYRON TRACT
Byron
UNION ISLAND
UPPER ROBERTS ISLAND
CLIFTON COURT FOREBAY
CONE ISLAND
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
FABIAN TRACT
STEWART TRACT
SOUTH BAY PUMPING PLANT
TRACY
BARKER SLOUGH PUMPING PLANT
HASTINGS TRACT
SACRAMENTO - SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
National Flood Insurance Program Approved Levees

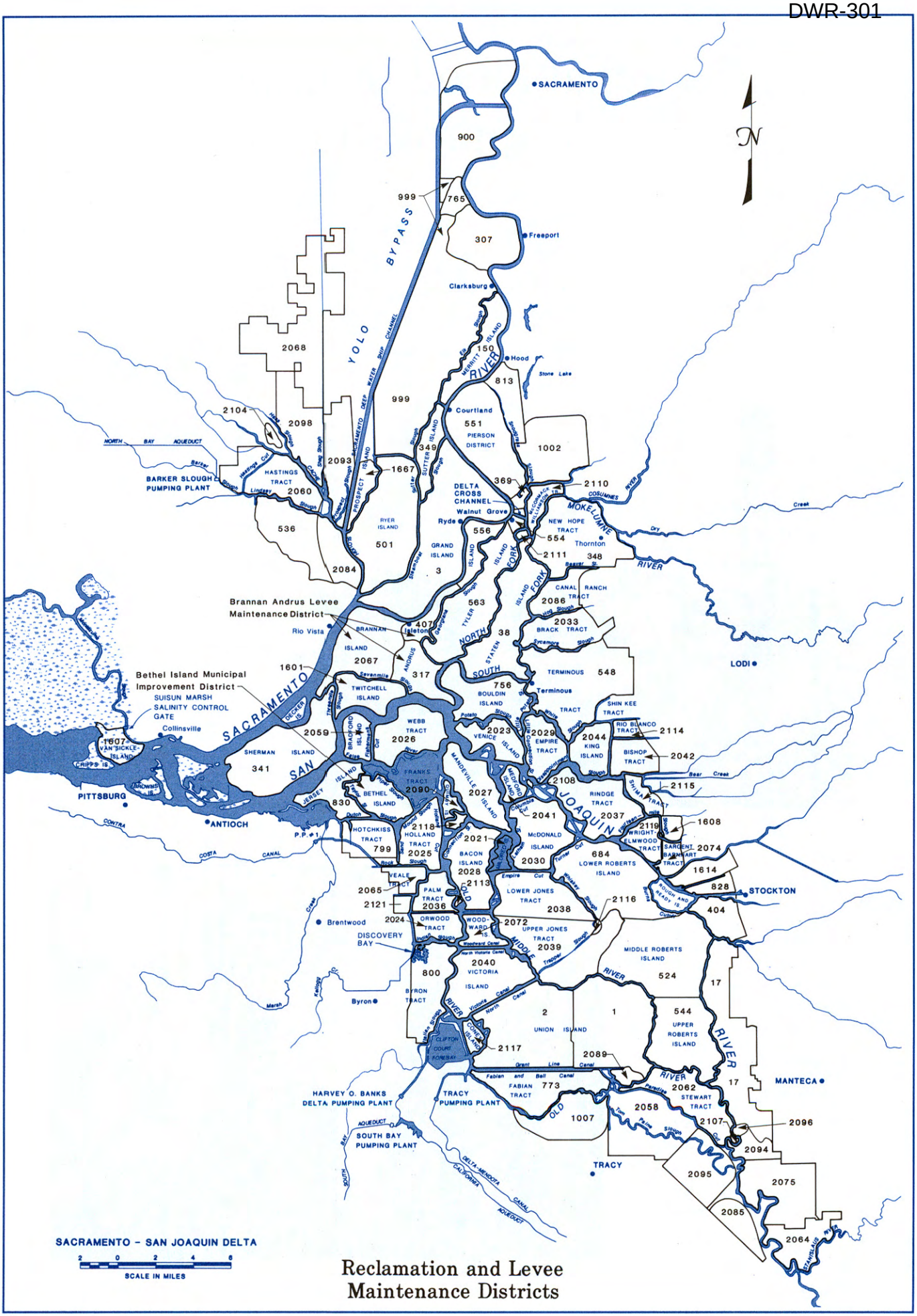
National Flood Insurance Program Approved Levees

Some levee systems within the Delta are certified to meet the minimum requirements for providing 100-year flood protection. This certification entitles property owners within the area protected by the levee system to purchase flood insurance at reduced rates through the National Flood Insurance Program. The community of Walnut Grove, which was threatened by the flooding on Tyler Island in 1986, is now surrounded by an improved levee system which was recently certified by the NFIP.

The town of Ryde is one of many communities protected from flooding by project levees.



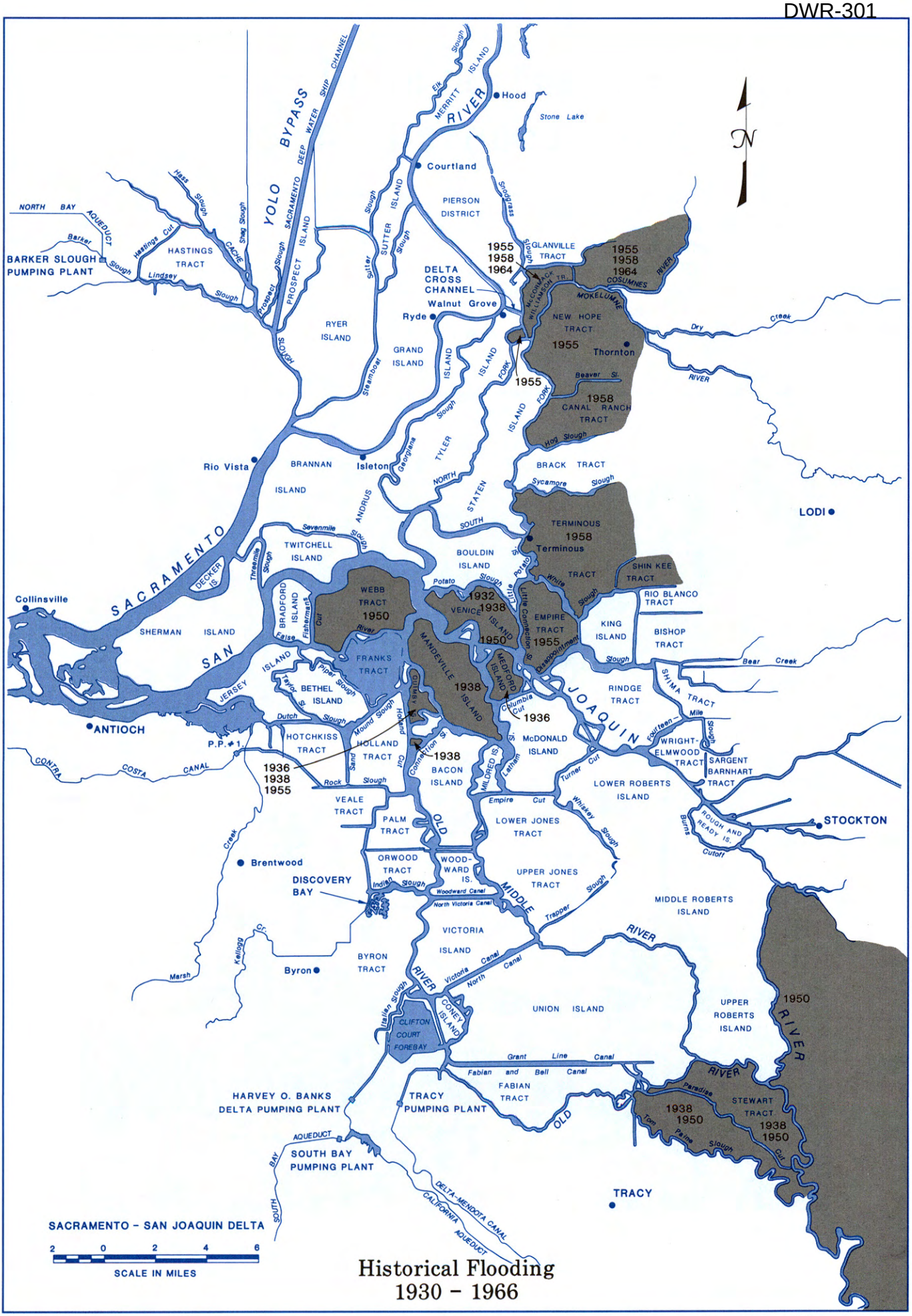
The U.S. Army Corps of Engineers working to increase the strength of project levees along the Sacramento River.


SACRAMENTO
Freeport
Clarksburg
Hood
Courtland
Walnut Grove
Ryde
Thornton
Rio Vista
Isleton
Collinsville
Terminous
Brentwood
Byron
ANTIOCH
PITTSBURG
STOCKTON
LODI
MANTECA
TRACY
DISCOVERY BAY
BARKER SLOUGH PUMPING PLANT
Brannan Andrus Levee Maintenance District
Bethel Island Municipal Improvement District
SUISUN MARSH SALINITY CONTROL GATE
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
SACRAMENTO RIVER
SAN JOAQUIN RIVER
YOLO BYPASS
DELTA CROSS CHANNEL
MOKELUMNE RIVER
OLD RIVER
MIDDLE RIVER
CONTRA COSTA CANAL
DELTA-MENDOTA CANAL
SACRAMENTO - SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Reclamation and Levee Maintenance Districts

Reclamation and Levee Maintenance Districts

In 1855, California passed the Reclamation District Act providing for sale of swamp and overflow lands at $1 per acre with payments over 5 years, and a 320-acre limit. Today, these lands in the Delta are ringed with levees and have their own districts for maintaining the levees. Some islands belong to more than one district. A more populated island, Bethel, has an organization with broader responsibilities which is known as the Bethel Island Municipal Improvement District. Information on expenditures for levee emergency work and annual maintenance for these districts is contained in Tables 1 and 2 (pages 81 - 84) along with values for acreage and miles of levee.

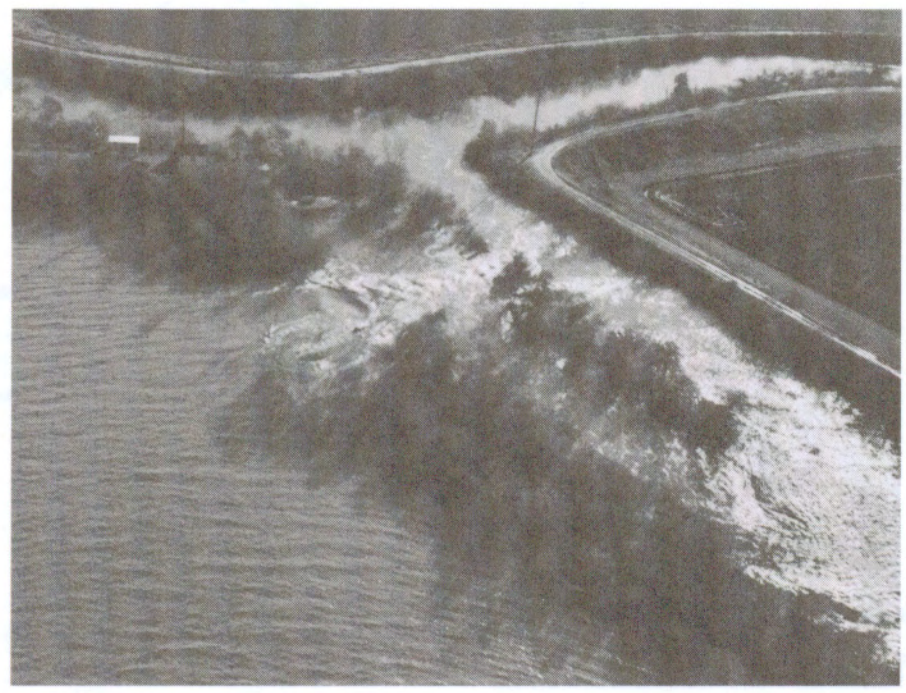
Levee rehabilitation on Twitchell Island.


N
Hood
Stone Lake
Courtland
PIERSON DISTRICT
Stough ISLAND
Elk
MERRITT ISLAND
RIVER
YOLO BYPASS
SACRAMENTO DEEP WATER SHIP CHANNEL
NORTH BAY AQUEDUCT
Barker
Hass Slough
Hastings Cut
Shag Slough
CACHE Slough
Lindsey Slough
BARKER SLOUGH PUMPING PLANT
HASTINGS TRACT
Prospect Slough
PROSPECT ISLAND
Sutter Slough
SUTTER ISLAND
Steamboat Slough
Snodgrass Slough
GLANVILLE TRACT
1955 1958 1964
1955 1958 1964 COSUMNES RIVER
McCORMACK WILLIAMSON TR.
DELTA CROSS CHANNEL
Walnut Grove
Ryde
RYER ISLAND
GRAND ISLAND
MOKELUMNE RIVER
NEW HOPE TRACT
1955
Thornton
Dry Creek
Beaver Sl.
1955
1958
CANAL RANCH TRACT
Hog Slough
Rio Vista
BRANNAN ISLAND
Isleton
Georgiana Slough
TYLER ISLAND
NORTH FORK MOKELUMNE RIVER
SOUTH FORK MOKELUMNE RIVER
BRACK TRACT
Sycamore Slough
LODI
ANDRUS ISLAND
STATEN ISLAND
TERMINOUS 1958
Terminous
SHIN KEE TRACT
Sevenmile Slough
TWITCHELL ISLAND
BOULDIN ISLAND
Potato Slough
White Slough
RIO BLANCO TRACT
Collinsville
SACRAMENTO
DECKER IS.
Threemile Slough
BRADFORD ISLAND
Fisherman's Cut
WEBB TRACT 1950
1932 1938 VENICE ISLAND
1950
EMPIRE TRACT 1955
Little Connection Slough
Disappointment Slough
KING ISLAND
BISHOP TRACT
Bear Creek
SHERMAN ISLAND
False River
SAN JOAQUIN
FRANKS TRACT
MANDEVILLE ISLAND 1938
MEDFORD ISLAND
Columbia Cut
1936
RINDGE TRACT
SHIMA TRACT
Fourteen Mile Slough
JERSEY ISLAND
Taylor Slough
BETHEL ISLAND
Piper Slough
Dutch Slough
Mound Slough
Holland Cut
ANTIOCH
P.P. # 1
HOTCHKISS TRACT
HOLLAND TRACT
Sand Cut
1938
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
CONTRA COSTA CANAL
1936 1938 1955
Rock Slough
BACON ISLAND
Connection Slough
MILDRED IS.
Latham
Turner Cut
LOWER ROBERTS ISLAND
VEALE TRACT
PALM TRACT
OLD
Empire Cut
LOWER JONES TRACT
Whiskey Slough
ROUGH AND READY IS.
Burns Cutoff
STOCKTON
Creek
Brentwood
ORWOOD TRACT
WOOD-WARD IS.
UPPER JONES TRACT
DISCOVERY BAY
Indian Slough
Woodward Canal
North Victoria Canal
MIDDLE
Trapper Slough
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
Kellogg Cr.
Marsh
BYRON TRACT
Byron
RIVER
Victoria Canal
North Canal
Italian Slough
CONEY ISLAND
UNION ISLAND
UPPER ROBERTS ISLAND
1950
RIVER
CLIFTON COURT FOREBAY
Grant Line Canal
Fabian and Bell Canal
FABIAN TRACT
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
OLD
RIVER
Paradise Cut
STEWART TRACT
1938 1950
Tom Paine Slough
AQUEDUCT
SOUTH BAY PUMPING PLANT
SOUTH BAY AQUEDUCT
DELTA-MENDOTA CANAL
CALIFORNIA AQUEDUCT
TRACY
SACRAMENTO - SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
Historical Flooding
1930 - 1966

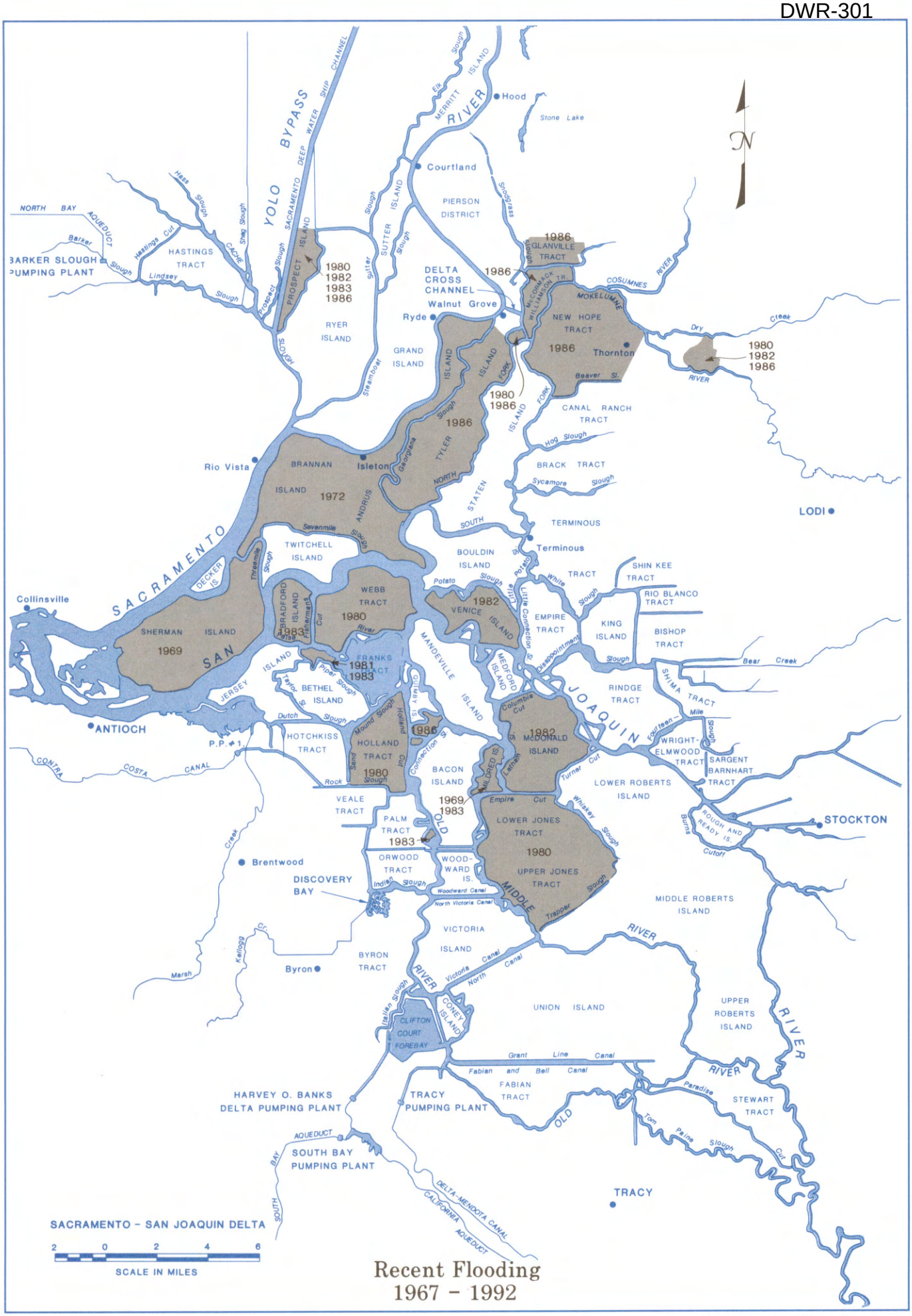
Historical Flooding 1930-1966

Levee failures are not rare occurrences in the Delta. Since original reclamation, each of the 70 islands or tracts has flooded at least once. The map at left shows those islands that flooded one or more times between 1930 and 1966. In some cases, the cost of repairs exceeded the appraised value of the land.

The Sacramento River north of Walnut Grove, December 1964.

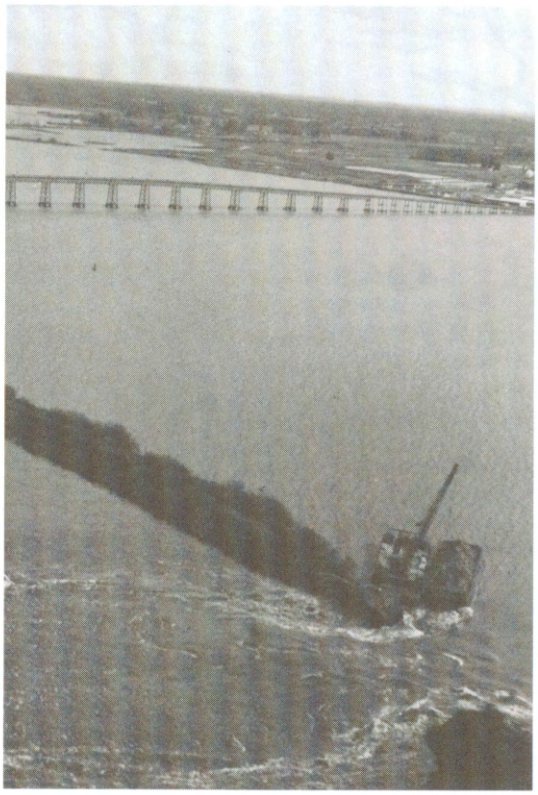


McCormack and Williamson Tract flooded, January 1965.


Recent Flooding
1967 – 1992
SACRAMENTO – SAN JOAQUIN DELTA
SCALE IN MILES
2 0 2 4 6
N
Hood
Courtland
Walnut Grove
Ryde
Rio Vista
Isleton
Collinsville
ANTIOCH
Brentwood
DISCOVERY BAY
Byron
Thornton
LODI
Terminous
STOCKTON
TRACY
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
BARKER SLOUGH PUMPING PLANT
P.P. #1
SACRAMENTO RIVER
SAN JOAQUIN RIVER
OLD RIVER
MIDDLE RIVER
YOLO BYPASS
DELTA CROSS CHANNEL
CONTRA COSTA CANAL
NORTH BAY AQUEDUCT
DELTA-MENDOTA CANAL
CALIFORNIA AQUEDUCT
PIERSON DISTRICT
GLANVILLE TRACT
1986
NEW HOPE TRACT
1986
1980 1982 1986
CANAL RANCH TRACT
BRACK TRACT
TERMINOUS
BOULDIN ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
KING ISLAND
BISHOP TRACT
EMPIRE TRACT
VENICE ISLAND
1982
SHIMA TRACT
RINDGE TRACT
MCDONALD ISLAND
1982
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
LOWER ROBERTS ISLAND
MIDDLE ROBERTS ISLAND
UPPER ROBERTS ISLAND
UNION ISLAND
LOWER JONES TRACT
1980
UPPER JONES TRACT
1980
1969 1983
WOODWARD IS.
VICTORIA ISLAND
BYRON TRACT
CLIFTON COURT FOREBAY
CONEY ISLAND
FABIAN TRACT
STEWART TRACT
BACON ISLAND
HOLLAND TRACT
1980
PALM TRACT
1983
ORWOOD TRACT
VEALE TRACT
HOTCHKISS TRACT
BETHEL ISLAND
FRANKS TRACT
1981 1983
WEBB TRACT
1980
BRADFORD ISLAND
1983
SHERMAN ISLAND
1969
TWITCHELL ISLAND
BRANNAN ISLAND
1972
GRAND ISLAND
RYER ISLAND
HASTINGS TRACT
PROSPECT ISLAND
1980 1982 1983 1986
1986
1980 1986
1986
MANDEVILLE ISLAND
MEDFORD ISLAND
MILDRED IS.
1986
BOUDIN ISLAND
DECKER IS.
1986

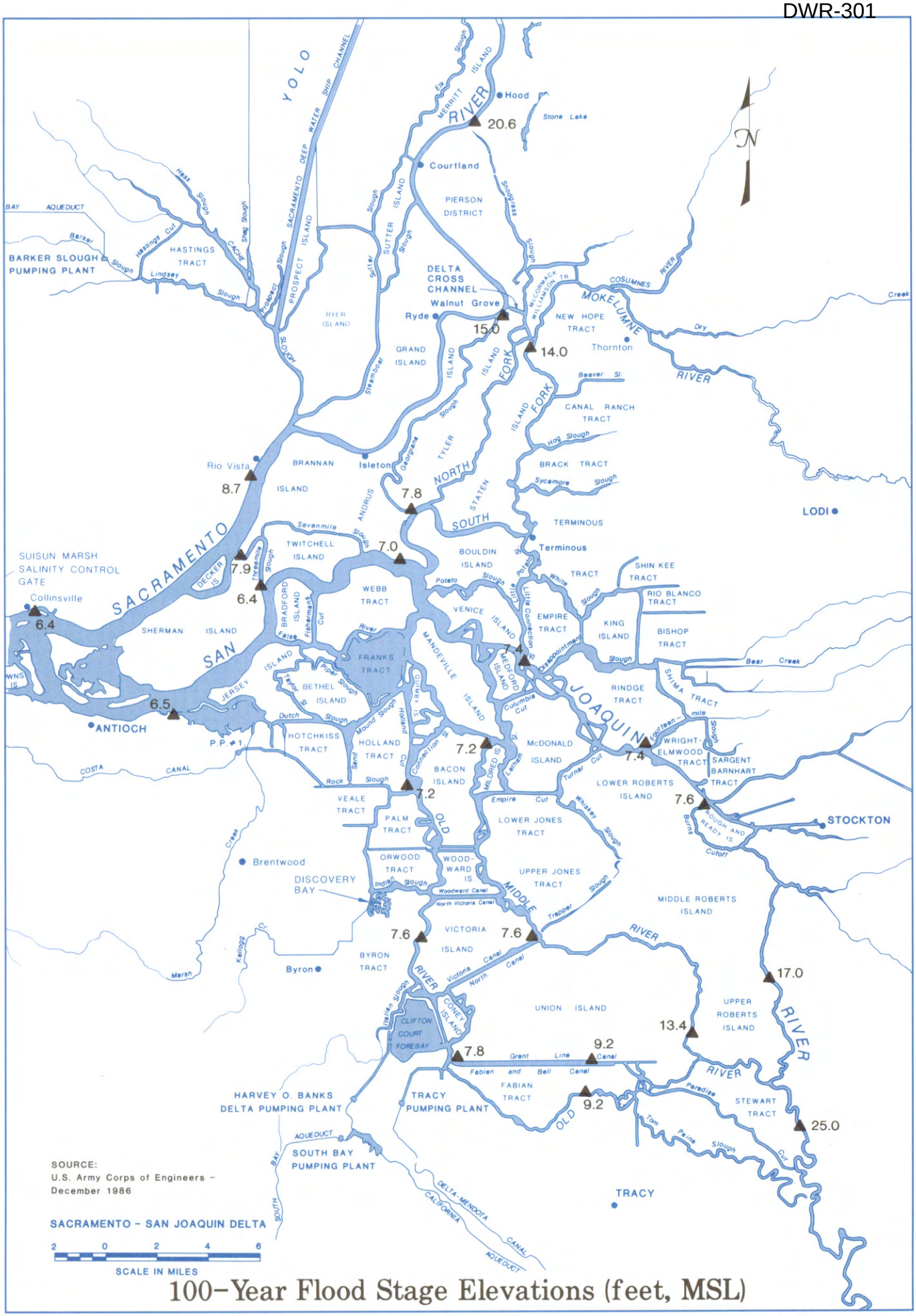
Recent Flooding 1967-1992

Flood flows reaching the Delta have been estimated to exceed 600,000 cubic feet per second. The most recent flood in the Delta occurred in 1986 when several islands in the north Delta flooded. This resulted in millions of dollars in damages, particularly in the town of Thornton.



Levee break on Sherman Island in 1969.

Islands flooded in the northern Delta, February 1986.



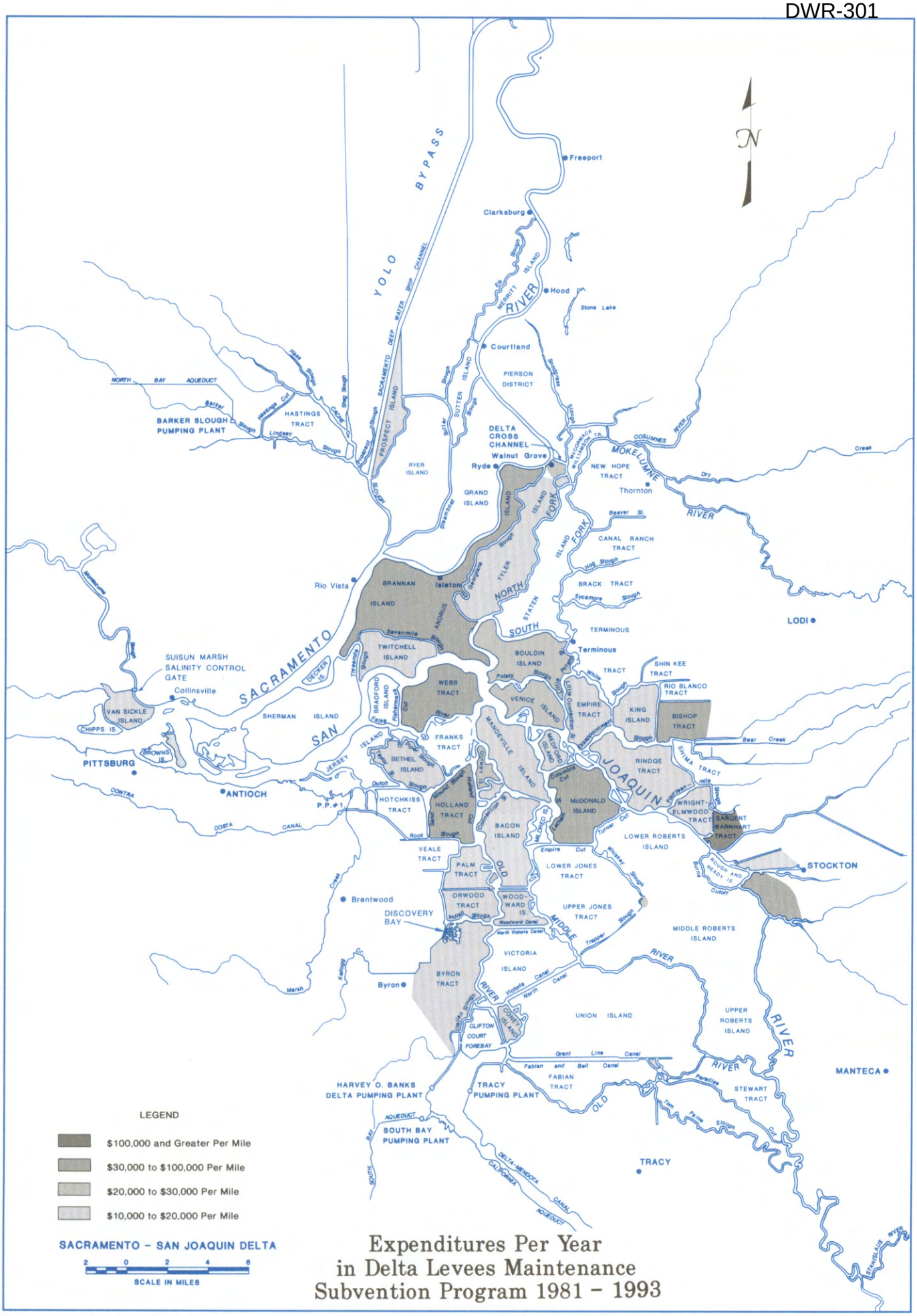
100–Year Flood Stage Elevations (feet, MSL)

Flood Stage Elevations

Rivers and channels surrounding the central and western Delta have a limited ability for carrying flood flows. For example, a flood causing water levels in the north Delta to increase by 10 feet may only cause a 1-foot increase in water levels in the central and western Delta. Sedimentation, which limits the flood-carrying capacity of the channels, has occurred in various places throughout the Delta, particularly along the South Fork of the Mokelumne River. In 1986, the U. S. Army Corps of Engineers estimated the 100-year flood stages to be as shown on the map at left.

Sedimentation in the Mokelumne River encourages vegetative growth which limits flood-carrying capacity.

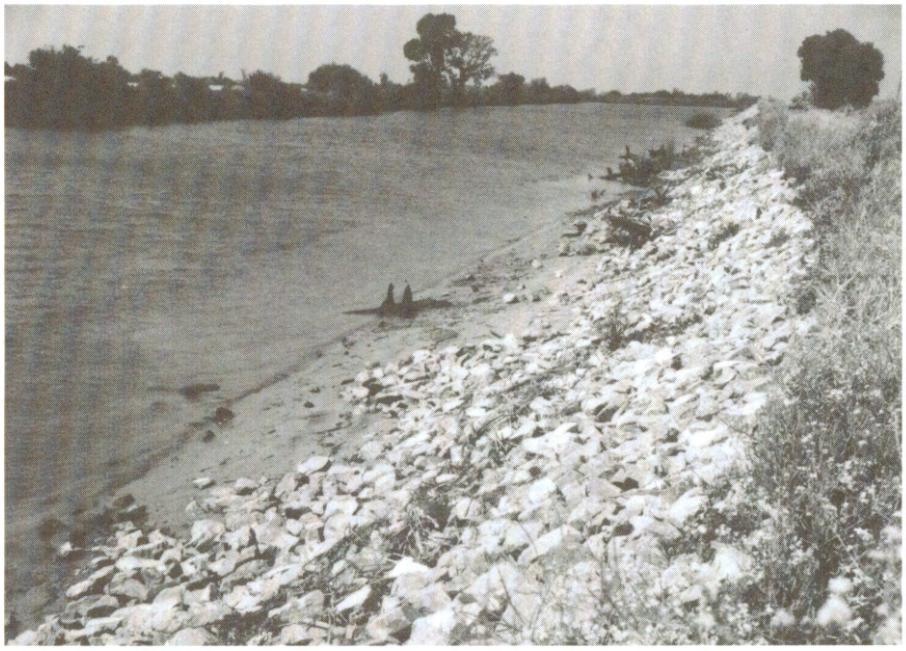
A combination of high tides, winter floodflows, and poor levees can result in flooded islands.



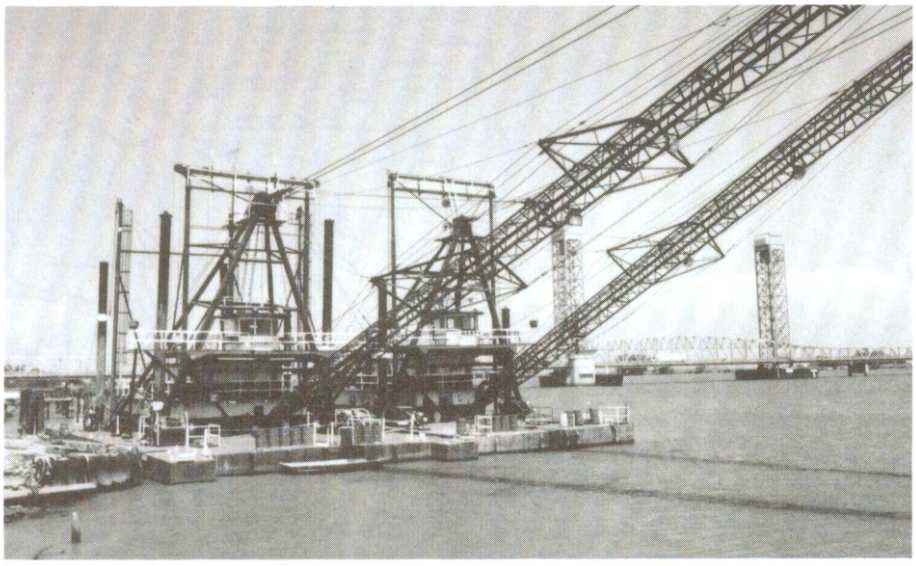
Expenditures Per Year in Delta Levees Maintenance Subvention Program 1981 – 1993

Delta Levee Maintenance Subvention Program Expenditures 1981-1993

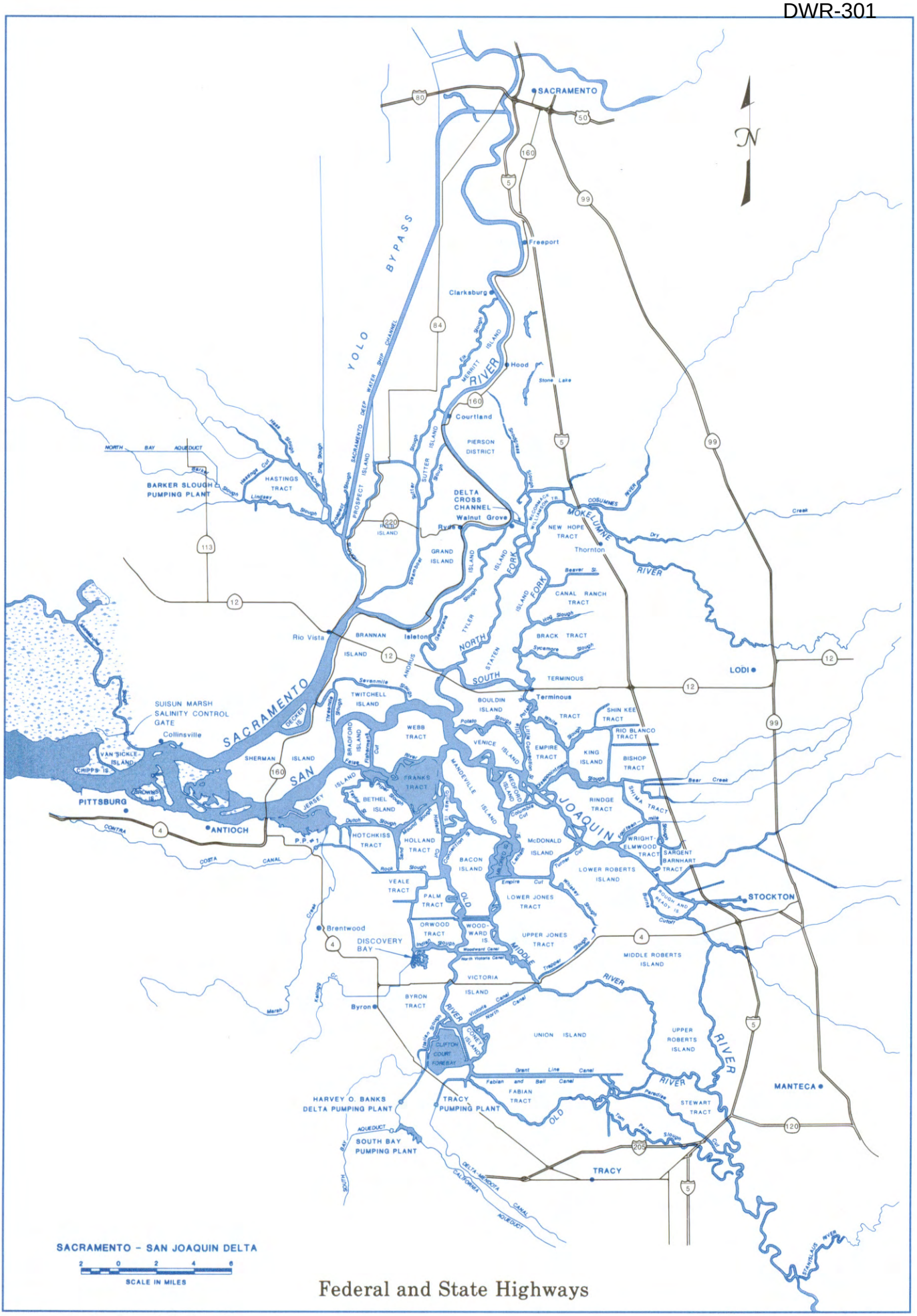
Waterside slopes of levees are subject to erosion from wind-generated waves, boat wakes, and water flowing at high velocity. State and local governments have invested millions of dollars in the past 10 years to maintain and repair eroded levees. In some instances, the expenditures exceeded the appraised value of the island or tract being protected. The map at left shows the average amount of State money spent per year of participation in the State cost-sharing program (Delta Levees Maintenance Subvention Program) for the period 1981-1991. This, along with other related information, is contained in Table 2 on page 83.



Some levees are protected from erosion by riprap.



Typical barge-mounted crane used for levee maintenance.



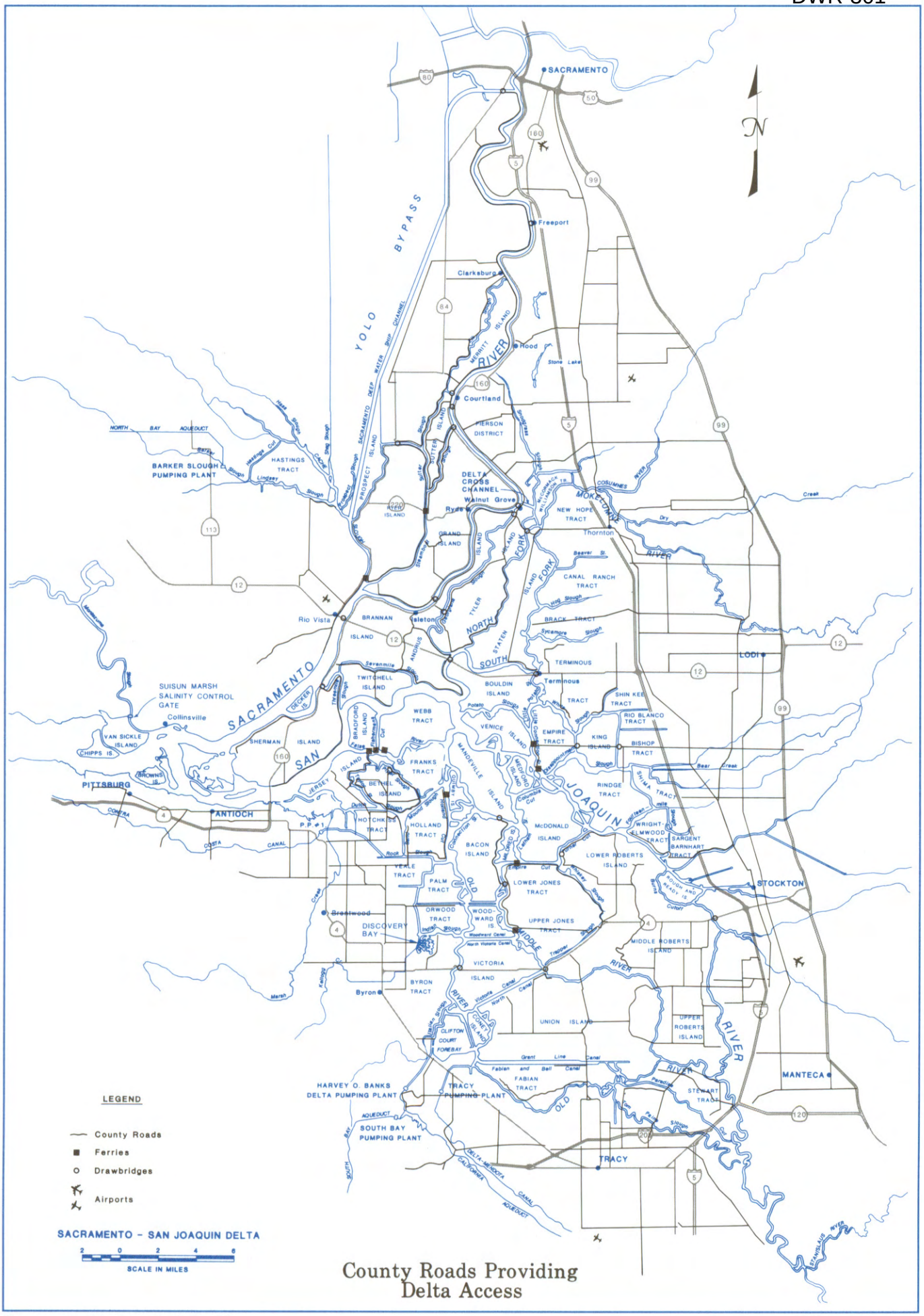
Federal and State Highways

Federal and State Highways

As shown on the map at left, federal highways (5 and 205) and State Highway 99 traverse the periphery of the Delta. Road access to more central Delta areas is provided by State Highways 4, 12, and 160 and numerous County Roads (see following section).

Traveling north through Isleton on Highway 160, a State Scenic Route.

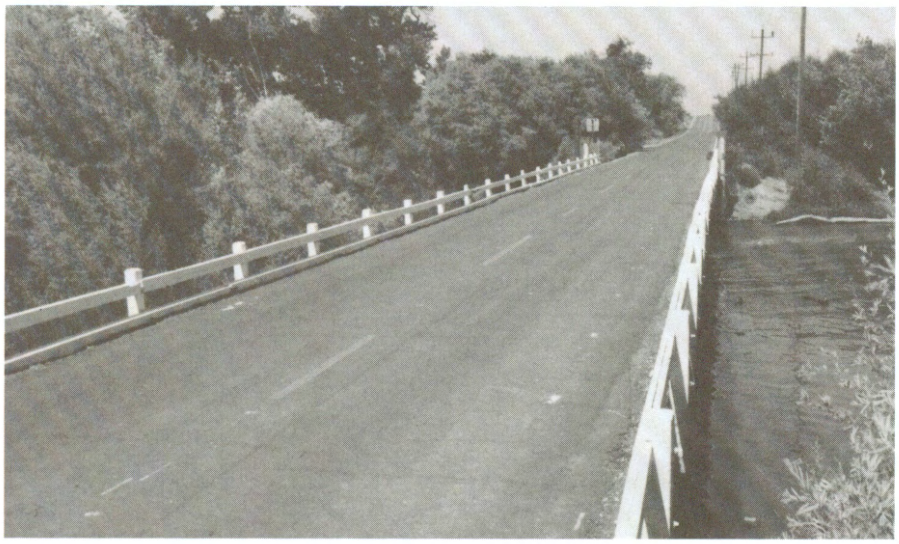
Rio Vista bridge on State Highway 12.



County Roads Providing Delta Access

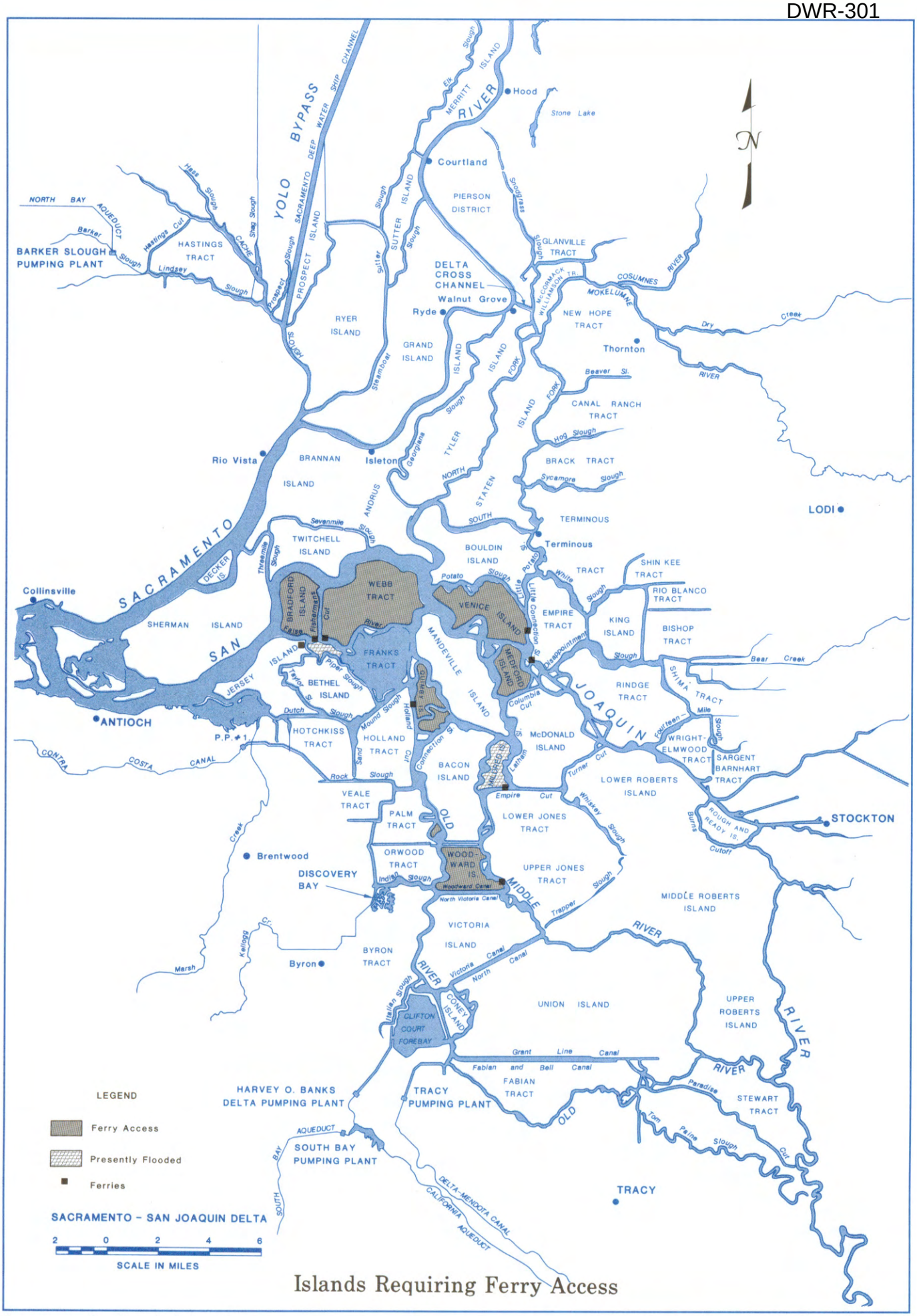
County Roads Providing Delta Access

Traffic on Delta roads continues to increase as commerce in the Delta grows. Drawbridges accommodate a combination of land and water traffic in the Delta. These bridges must be lifted frequently during the summer boating season. The map at left shows the network of county roads that serves most Delta islands.



Looking west on Lambert Road crossing Snodgrass Slough west of Courtland.

View of a bridge on a local road in the Delta.

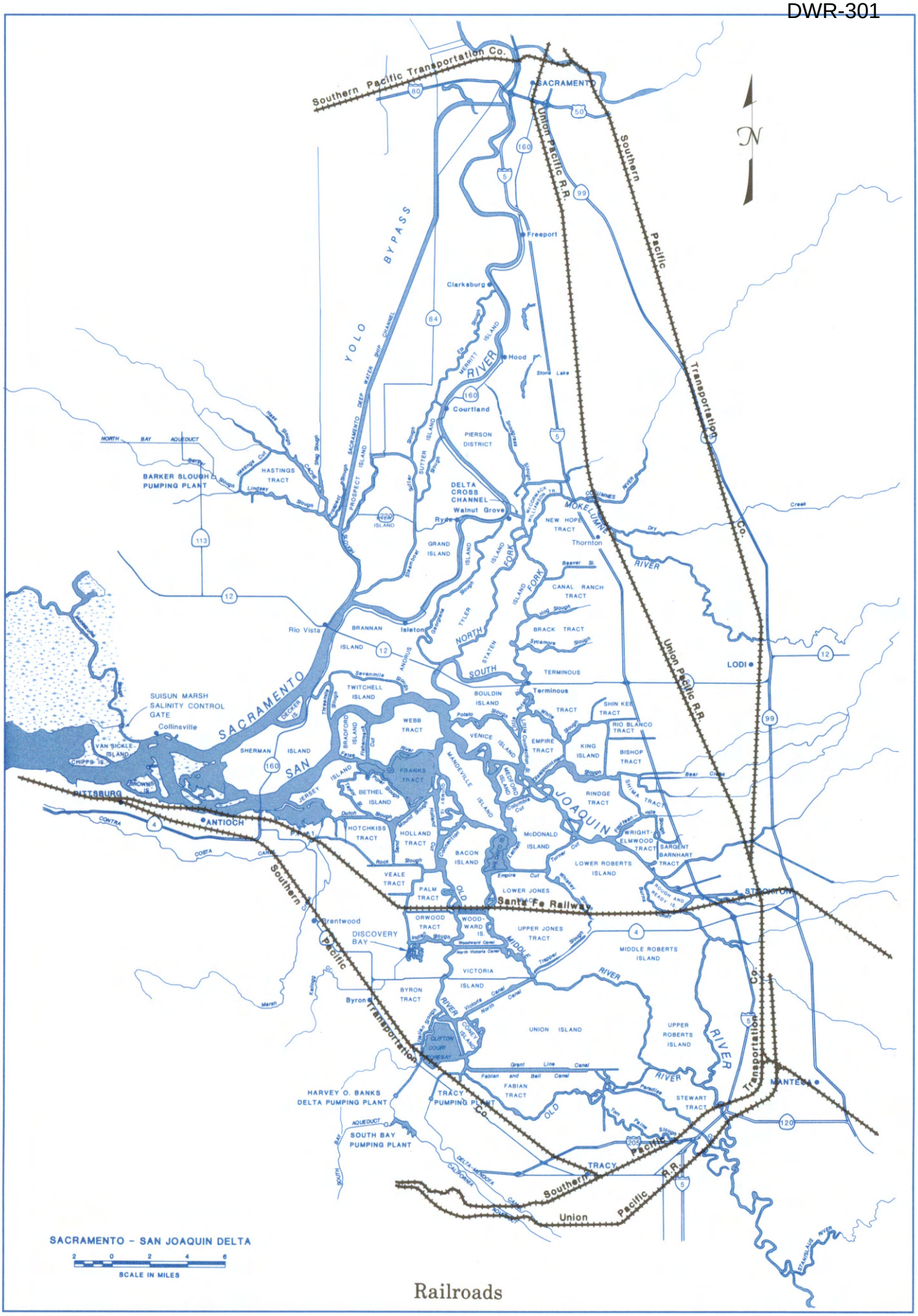


Islands Requiring Ferry Access

Islands Requiring Ferry Access

Although many bridges have been built to accommodate traffic and provide road access to most of the Delta, ferries are still needed to reach several Delta islands. In fact, the Delta is one of the few places where ferries are still a way of life. They can, however, be a nuisance to modern life as time delays slow traffic and load limits restrict trucks. Ferry crossings to these islands are shown on the map at left.

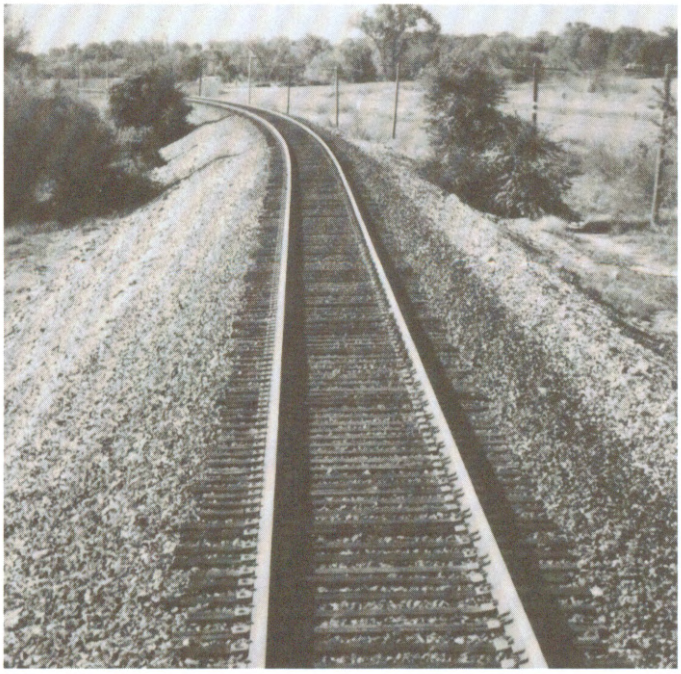
Howard Landing ferry crossing Steamboat Slough adjacent to Grand Island.


Southern Pacific Transportation Co.
SACRAMENTO
Union Pacific R.R.
Southern Pacific Transportation Co.
Freeport
Clarksburg
Hood
Courtland
YOLO BYPASS
SACRAMENTO DEEP WATER SHIP CHANNEL
MERRITT ISLAND
RIVER
PIERSON DISTRICT
SUTTER ISLAND
PROSPECT ISLAND
HASTINGS TRACT
BARKER SLOUGH PUMPING PLANT
NORTH BAY AQUEDUCT
DELTA CROSS CHANNEL
Walnut Grove
Ryde
GRAND ISLAND
NEW HOPE TRACT
MOKELUMNE
Thornton
RIVER
CANAL RANCH TRACT
BRACK TRACT
Rio Vista
BRANNAN ISLAND
Isleton
NORTH FORK
SOUTH FORK
TERMINOUS
Terminous
LODI
SUISUN MARSH SALINITY CONTROL GATE
Collinsville
SACRAMENTO
TWITCHELL ISLAND
BOULDIN ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
WEBB TRACT
VENICE ISLAND
EMPIRE TRACT
KING ISLAND
BISHOP TRACT
VAN SICKLE ISLAND
CHIPPS IS.
BROWNS IS.
SHERMAN ISLAND
BRADFORD ISLAND
FRANKS TRACT
MANDEVILLE ISLAND
MEDFORD ISLAND
RINDGE TRACT
SHIMA TRACT
PITTSBURG
ANTIOCH
BETHEL ISLAND
JERSEY ISLAND
HOTCHKISS TRACT
HOLLAND TRACT
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
BACON ISLAND
LOWER ROBERTS ISLAND
VEALE TRACT
PALM TRACT
LOWER JONES TRACT
STOCKTON
Santa Fe Railway
Brentwood
DISCOVERY BAY
ORWOOD TRACT
WOODWARD IS.
UPPER JONES TRACT
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
BYRON TRACT
Byron
UNION ISLAND
UPPER ROBERTS ISLAND
CLIFTON COURT FOREBAY
CONEY ISLAND
FABIAN TRACT
STEWART TRACT
MANTECA
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
TRACY
Union Pacific R.R.
SACRAMENTO - SAN JOAQUIN DELTA
SCALE IN MILES

Railroads

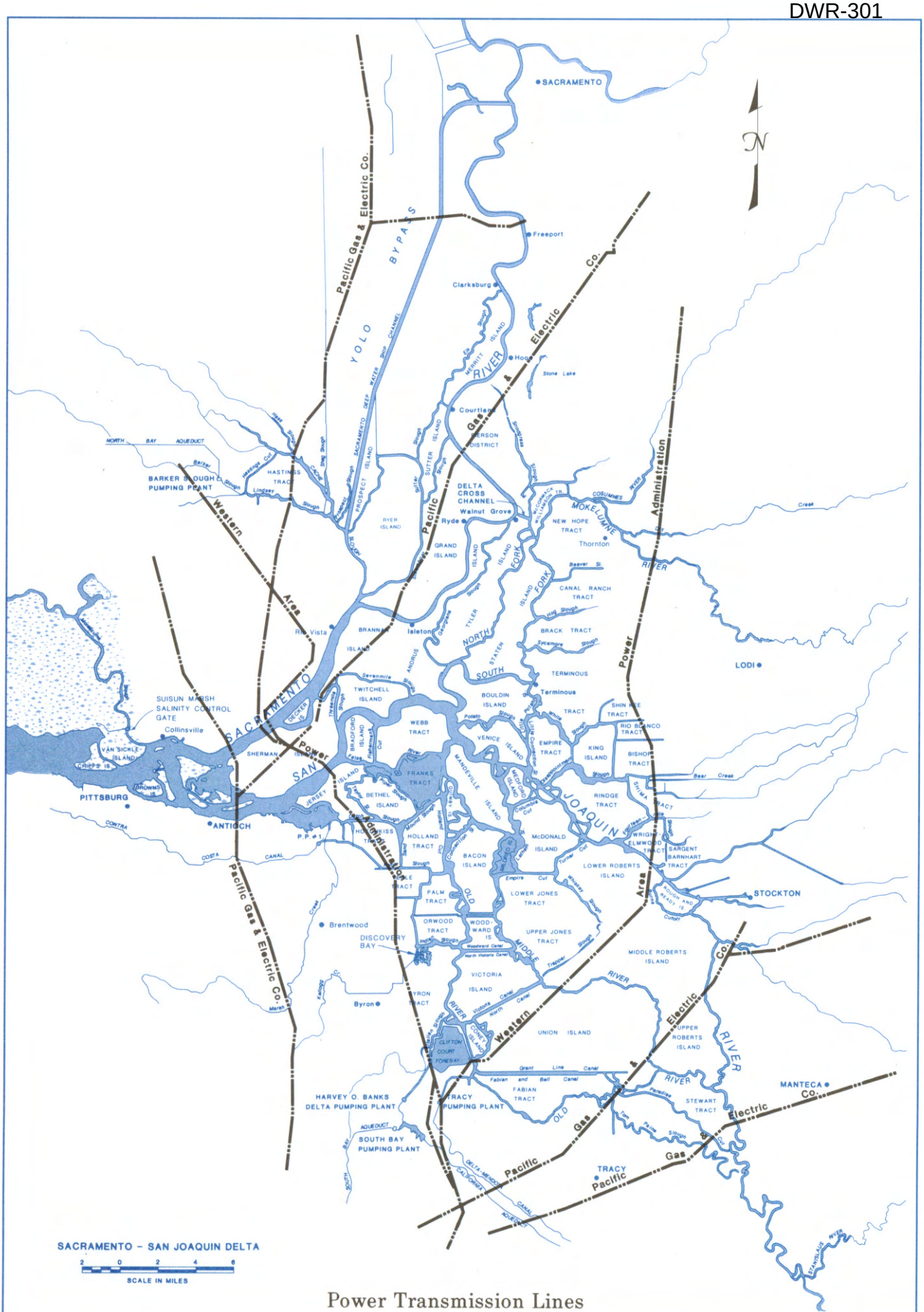
Railroads

As shown on the map at left, the Southern Pacific, Union Pacific, and Santa Fe railroads maintain active railways in the Delta. However, only Santa Fe traverses the Delta lowlands, and requires levees for protection. The others are on the periphery of the Delta.



Looking south along the Union Pacific Railroad line heading toward the Cosumnes River crossing.

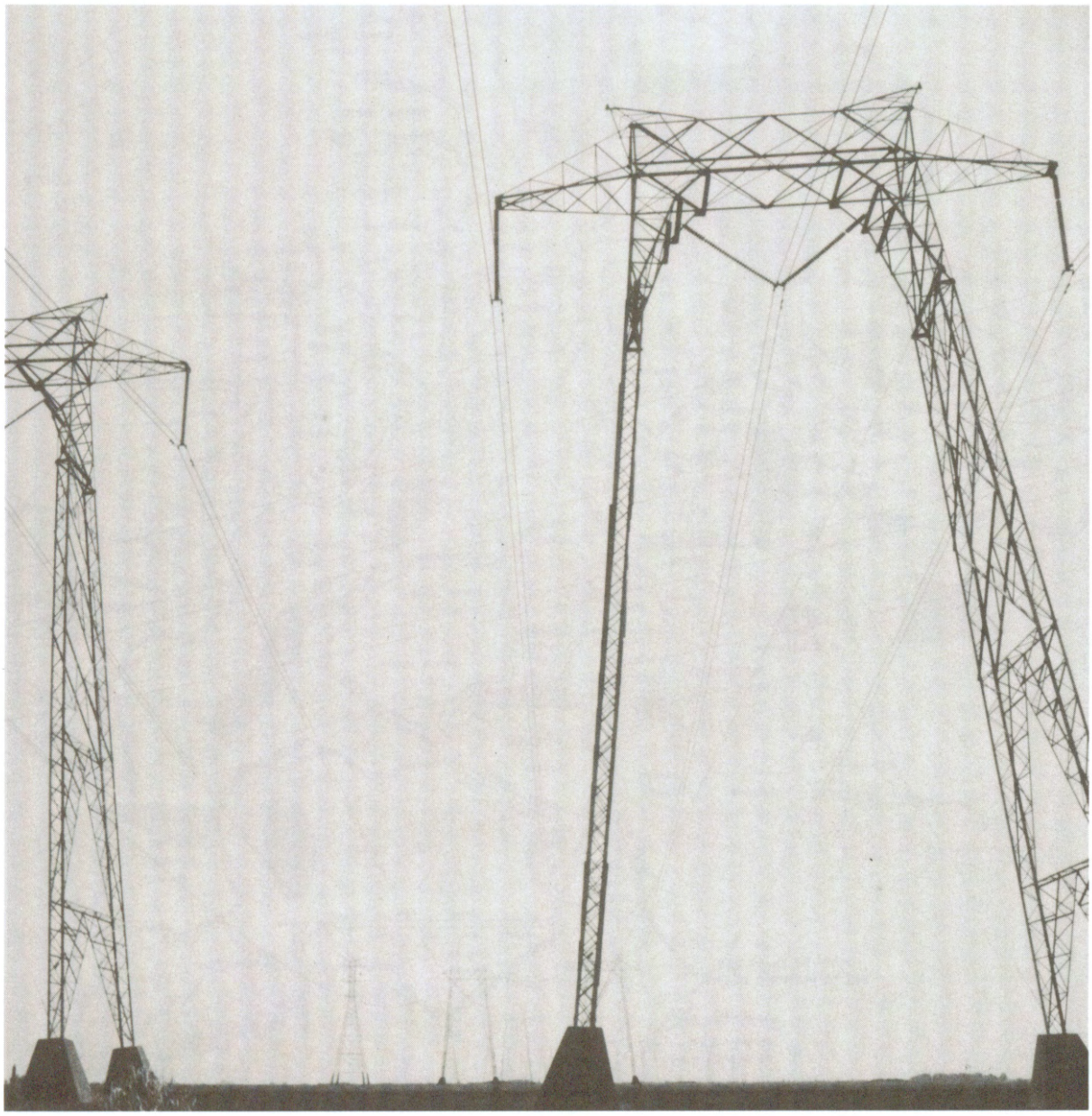
A raised section of the Union Pacific Railroad line northeast of McCormack-Williamson Tract.



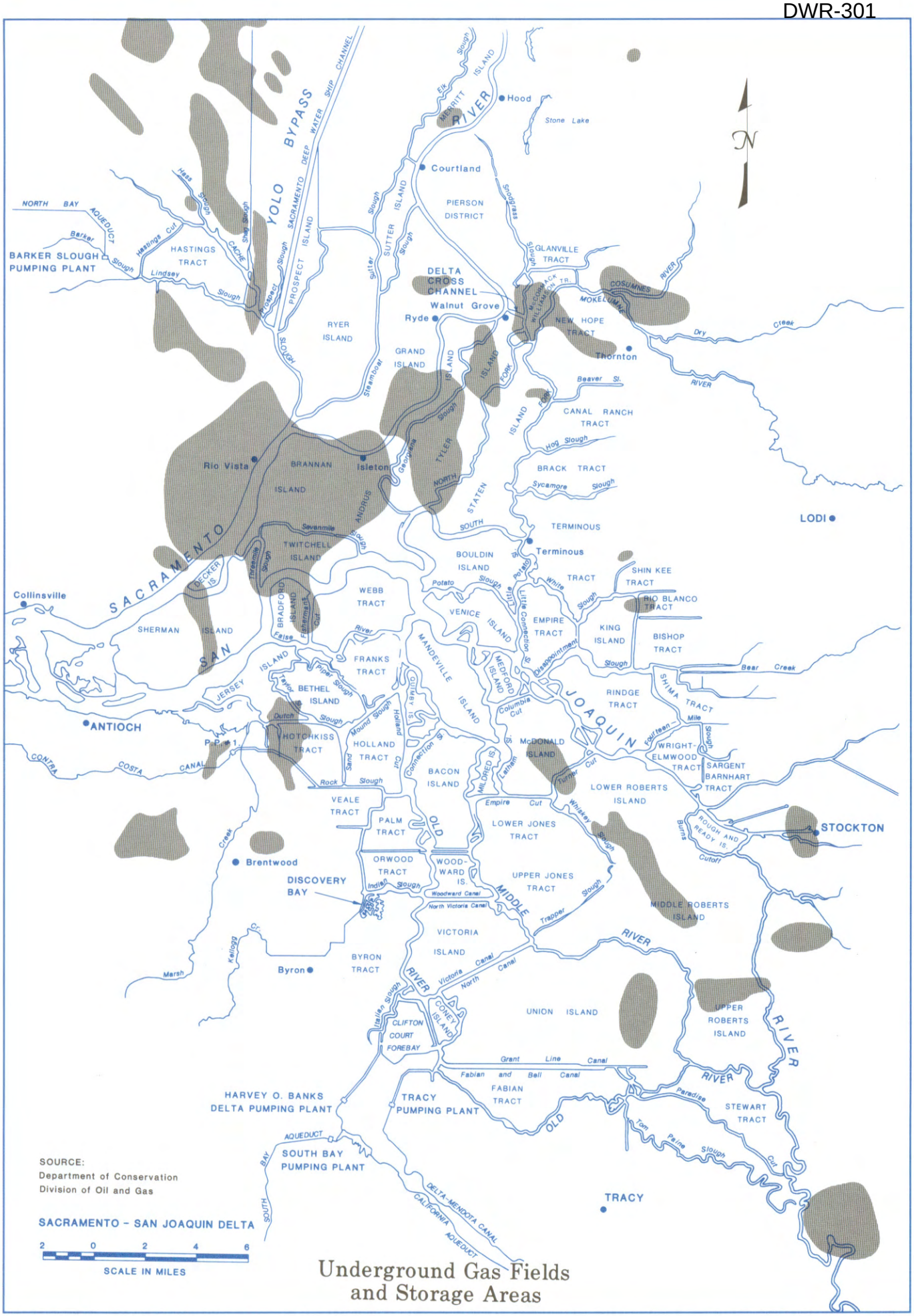
Power Transmission Lines

Power Transmission Lines

Numerous power transmission lines of up to 500 kilovolts cross Delta islands and waterways, and more are being planned, such as the California-Oregon transmission project. The map at left shows existing transmission lines.



Pacific Gas and Electric Company power transmission line.

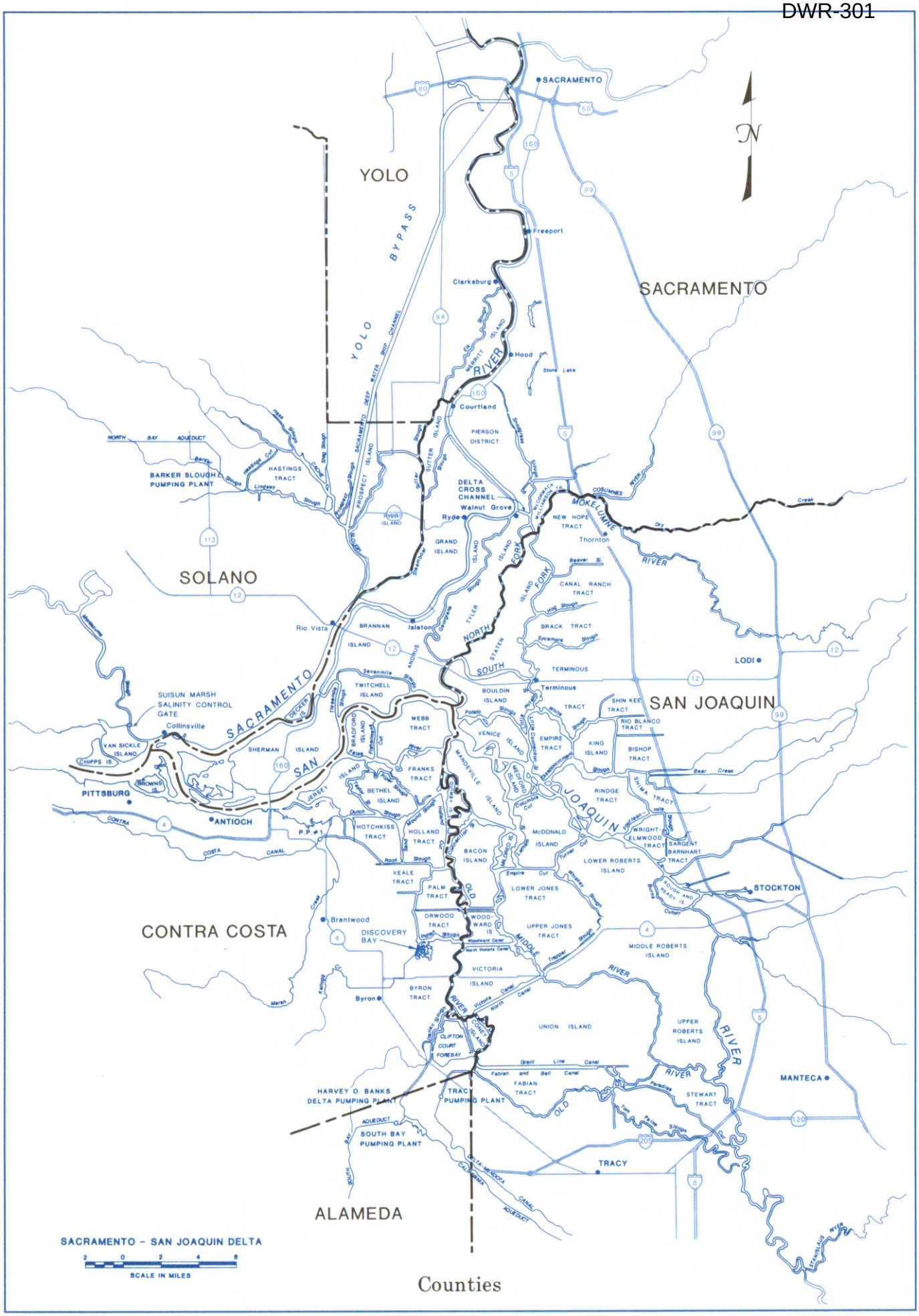


Underground Gas Fields and Storage Areas

Underground Gas Fields and Storage Areas

Natural gas was first discovered in the Delta in 1935. Today, the delta serves as an important natural gas source and an underground gas storage area. The various gas fields and storage areas are shown on the map at left. The photograph below shows a PG&E facility with 14 MMscf/d of natural gas capacity. This facility has two 1,000 hp compressors capable of compressing the low pressure (30 psig) natural gas to the pipeline pressure of 350 psig.

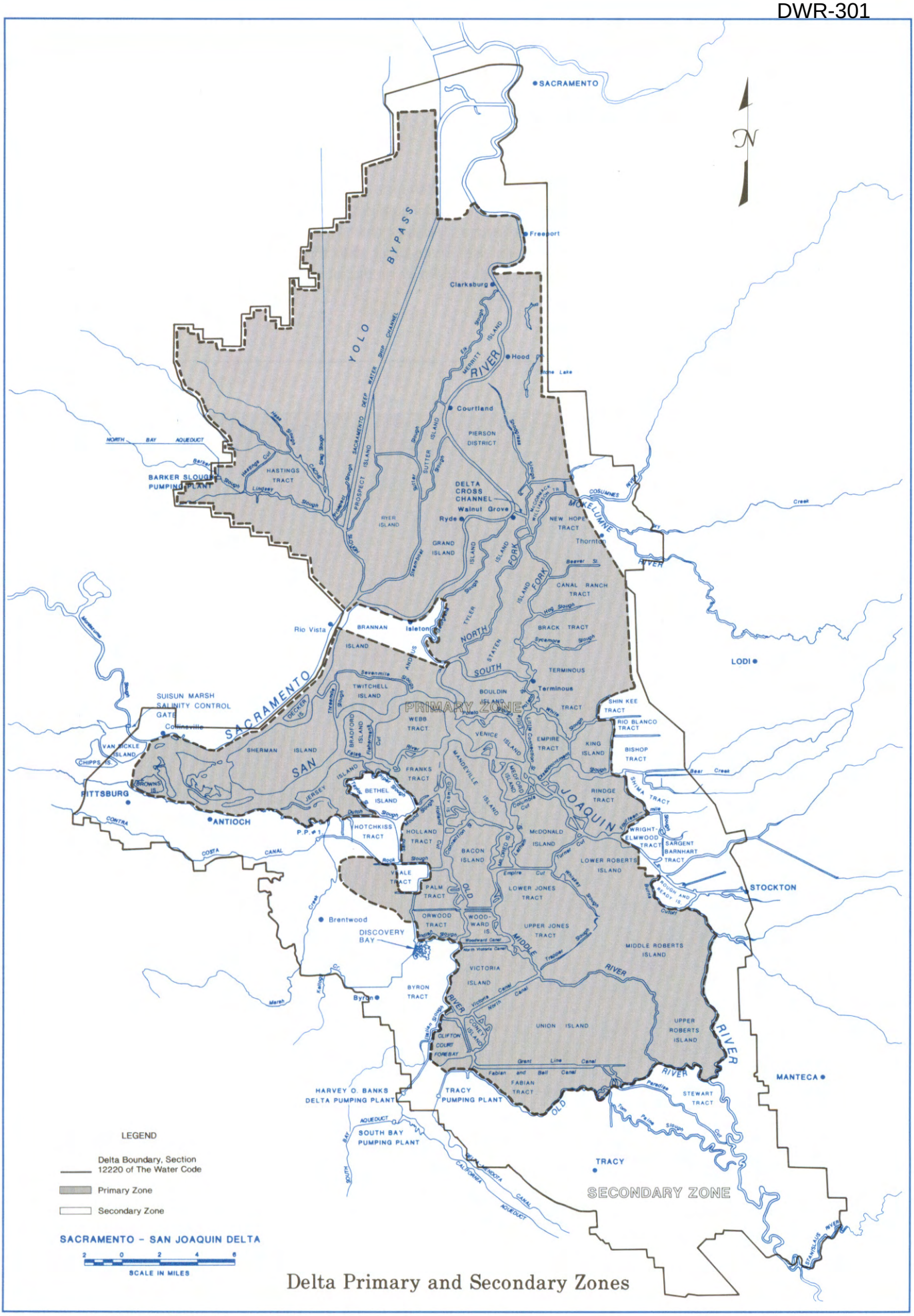
One of Pacific Gas and Electric Company's natural gas facilities on Brannan Island.


SACRAMENTO
YOLO
SACRAMENTO
SOLANO
SAN JOAQUIN
CONTRA COSTA
ALAMEDA
YOLO BYPASS
YOLO DEEP WATER SHIP CHANNEL
SACRAMENTO RIVER
DELTA CROSS CHANNEL
MOKELUMNE RIVER
NORTH FORK
SOUTH FORK
OLD RIVER
MIDDLE RIVER
SAN JOAQUIN RIVER
Freeport
Clarksburg
Hood
Courtland
Walnut Grove
Ryde
Thornton
Rio Vista
Isleton
Collinsville
Terminous
LODI
STOCKTON
MANTECA
TRACY
Brentwood
Byron
PITTSBURG
ANTIOCH
BARKER SLOUGH PUMPING PLANT
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
SUISUN MARSH SALINITY CONTROL GATE
DISCOVERY BAY
CLIFTON COURT FOREBAY
SACRAMENTO - SAN JOAQUIN DELTA
SCALE IN MILES
Counties

Counties

Portions of six counties — Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo — make up the Delta, as shown on the map at left. Each of these counties is represented by an elected board of supervisors and has the responsibility of land use planning and zoning. The Delta Protection Act of 1992 provides for regional coordination by establishing the Delta Protection Commission. The Commission is to develop a long-term resource management plan for an area designated as the Delta Primary Zone. All local general plans for areas within this zone are required to be consistent with the regional plan. The Delta Primary Zone is shown on the following map.

Court House in Courtland.



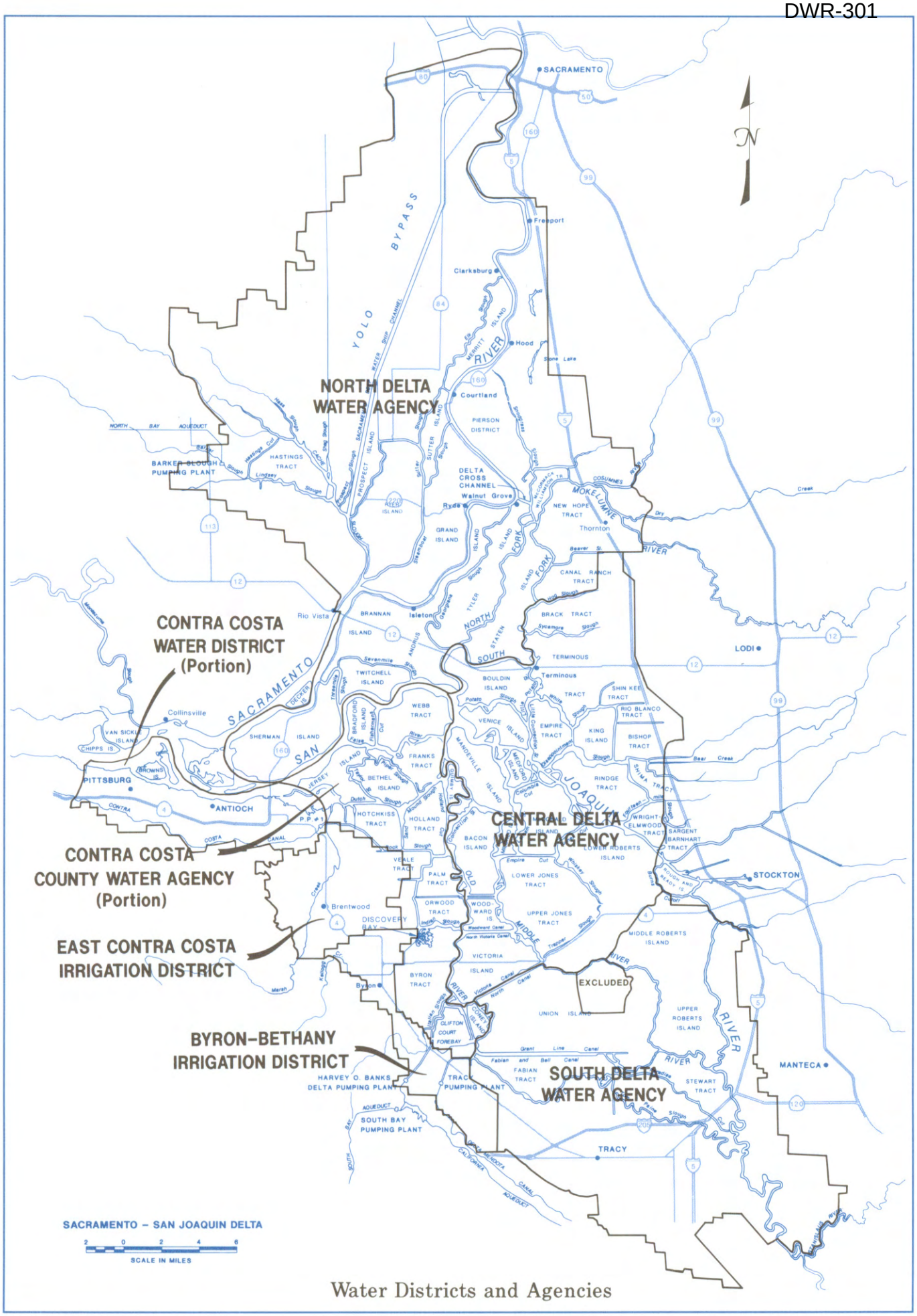
Delta Primary and Secondary Zones

Delta Protection Commission

The Delta Protection Commission was established by the Delta Protection Act of 1992. The Commission is to develop a long-term resource management plan for the Delta Primary Zone. As stated in the Act, the goals of this regional plan are to "protect, maintain and, where possible, enhance and restore the overall quality of the delta environment, including, but not limited to, agriculture, wildlife habitat, and recreational activities." The Delta Primary Zone is illustrated to the left. Text of the Delta Protection Act of 1992 is presented on pages 101 - 107. The Act acknowledges that agricultural land within the Delta is of significant value as open space and habitat for water fowl using the Pacific Flyway. As such, the regional plan is to protect agricultural land within the Primary Zone from the intrusion of nonagricultural uses. All local general plans for areas within the Primary Zone are required to be consistent with the regional plan. The Secondary Zone consists of areas within the statutory Delta (as defined in Section 12220 of the California Water Code) but not part of the Primary Zone. Local general plans for land use in the Secondary Zone are not required to conform to a regional plan.

During fall and winter, agricultural fields in the Delta provide habitat for large populations of migratory waterfowl. One of the goals of the Delta Protection Act of 1992 is to preserve agricultural land within the Primary Zone.

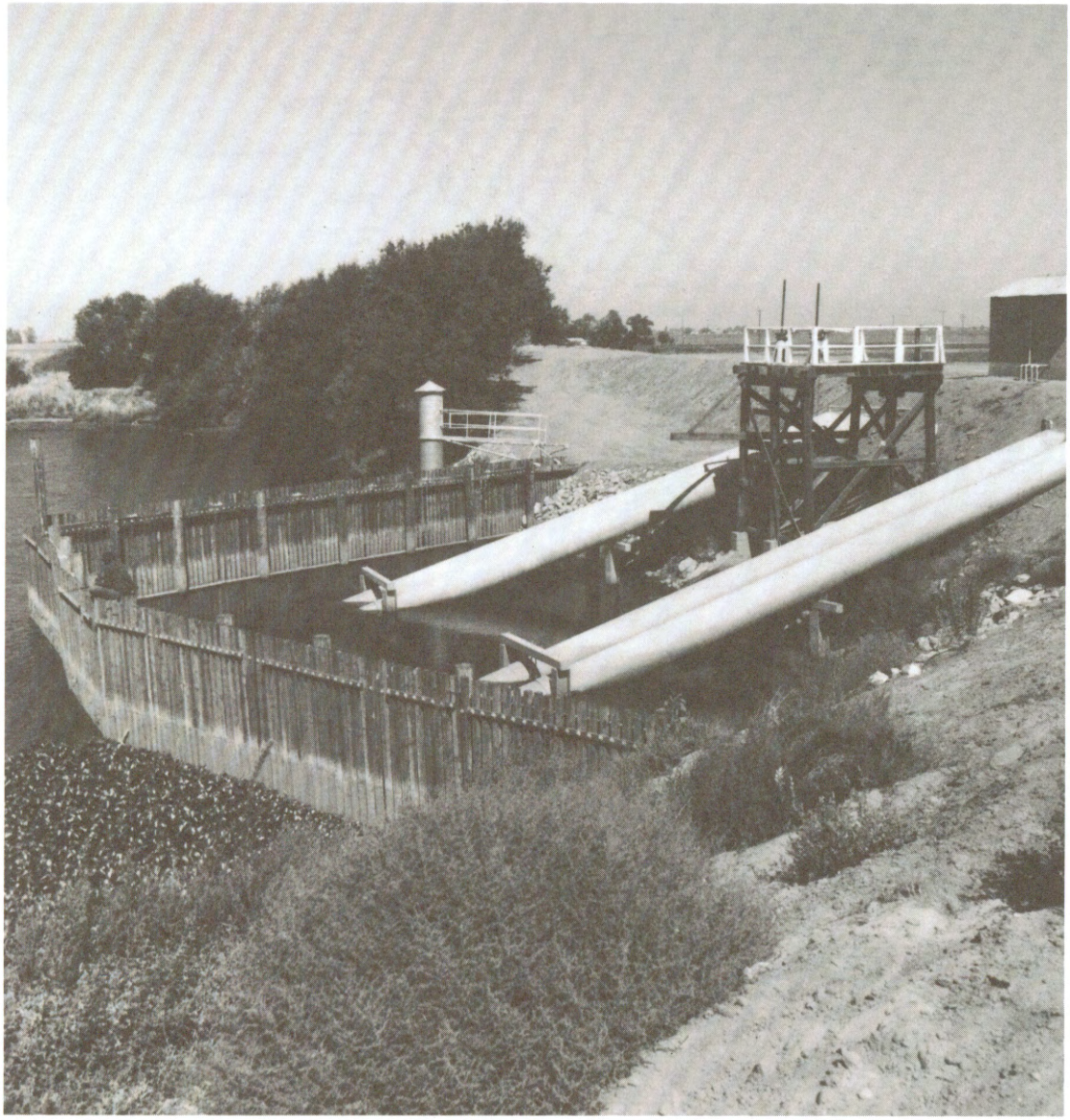
The Delta is a popular area for water-based recreation such as fishing, sailing, and water-skiing. An objective of the regional plan for the Primary Zone is to maintain, and possibly enhance, recreational opportunities in the Delta.



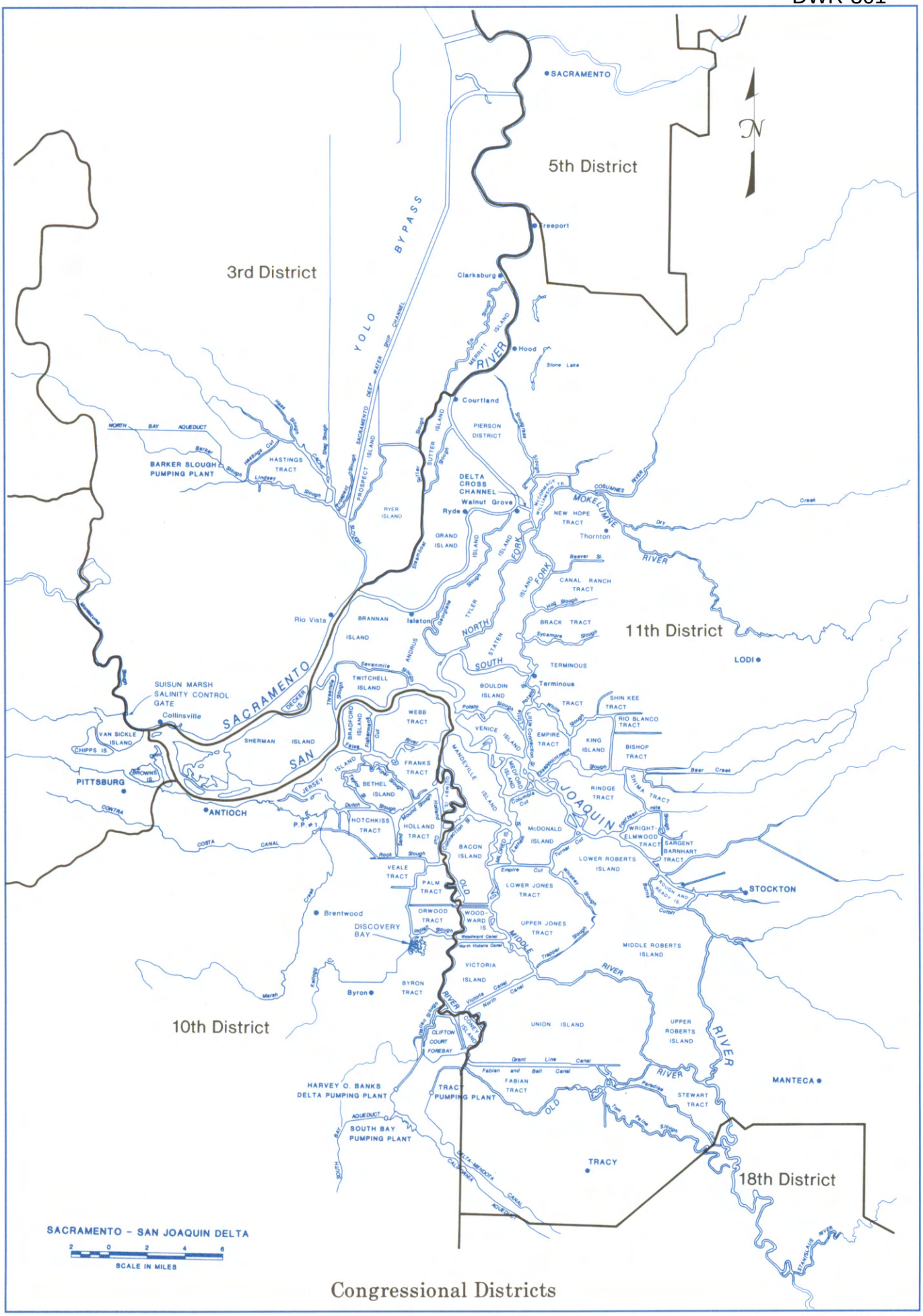
Water Districts and Agencies

Water Districts and Agencies

In November 1965, the Department of Water Resources and the U.S. Bureau of Reclamation reached agreement with some Delta interests on the quality of agricultural water to be maintained by the State Water Project and the Central Valley Project at various locations in the Delta. There was, however, no legal entity to sign the related contracts. As a result, the California Legislature created the Delta Water Agency. This agency was replaced with three separate agencies in 1973 — the North Delta Water Agency, the Central Delta Water Agency, and the South Delta Water Agency. Contra Costa County Water Agency, East Contra Costa Irrigation District, and Byron-Bethany Irrigation District are the remaining local water-supply organizations. They are located in the southwest area of the Delta as shown on the map.



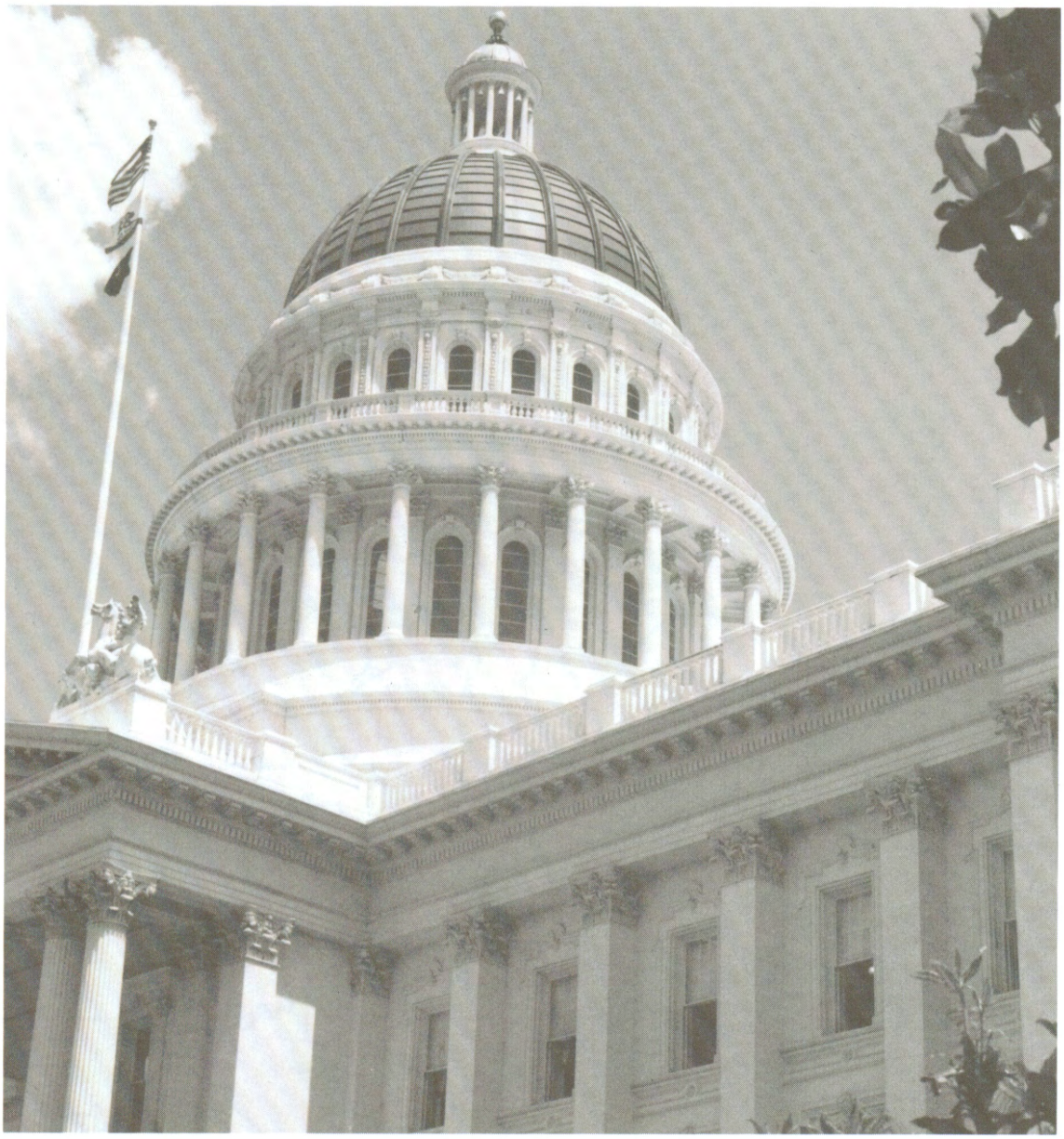
Siphon at Tom Paine Slough, installed as part of a settlement contract to improve water quality in a portion of the South Delta Water Agency.



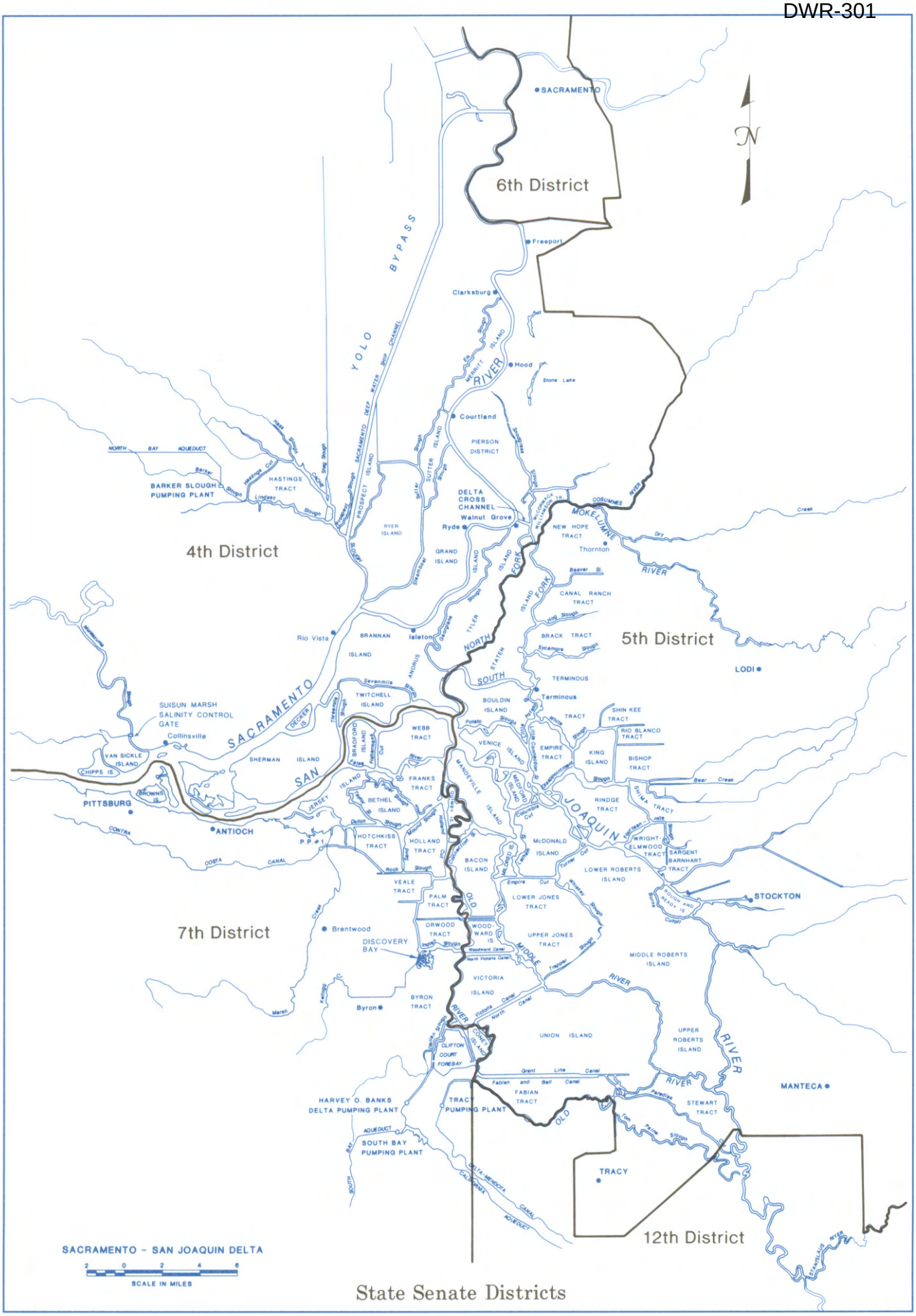
Congressional Districts

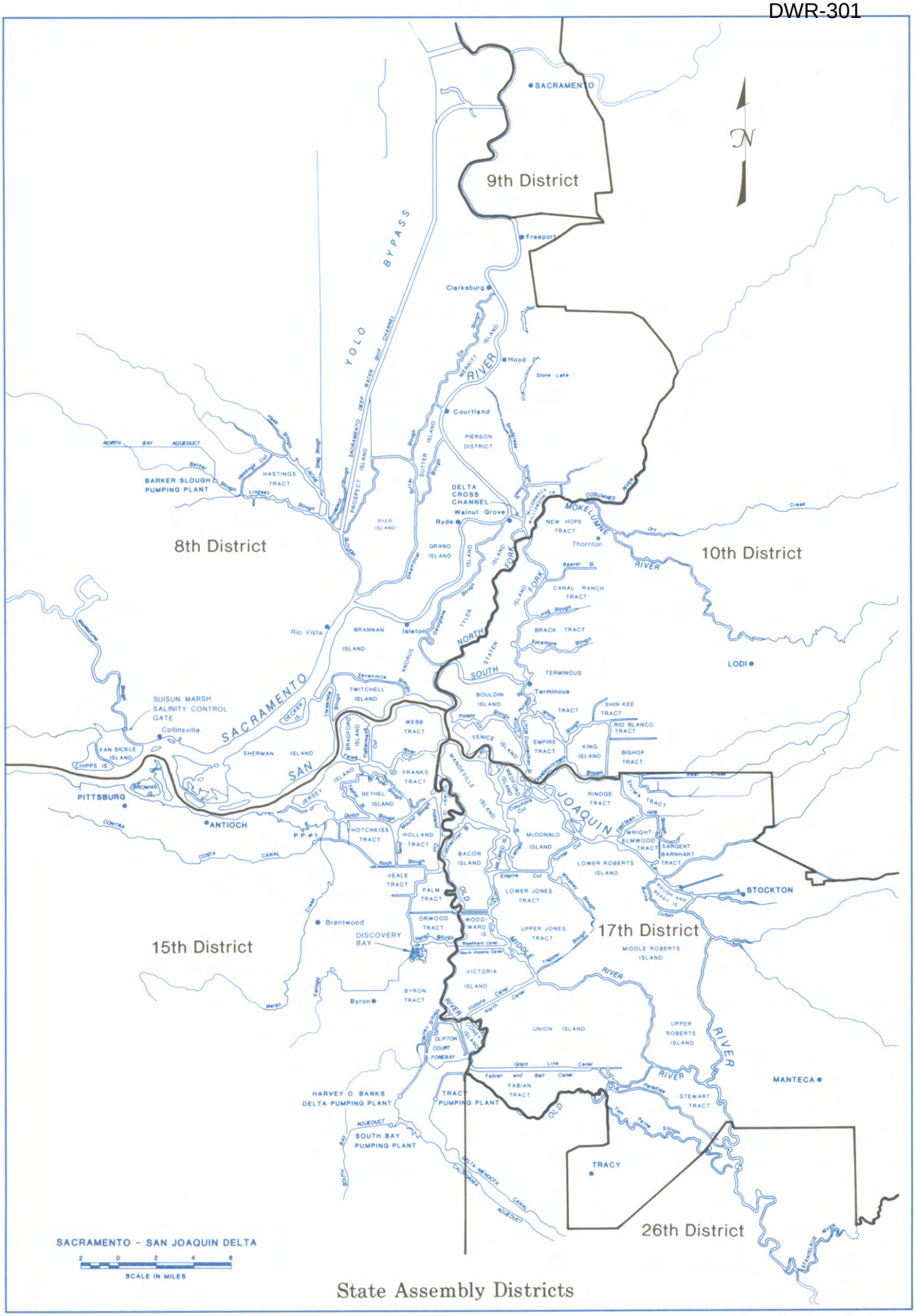
Legislative Districts

District boundaries for the Assembly, Senate, and Congressional Districts were changed in accordance with the 1990 census under a court ordered reapportionment plan. The reapportioned Assembly, Senate, and Congressional Districts covering the Delta are shown on the map at left and on the following pages. A list of the names of legislators for these districts is on page 121.

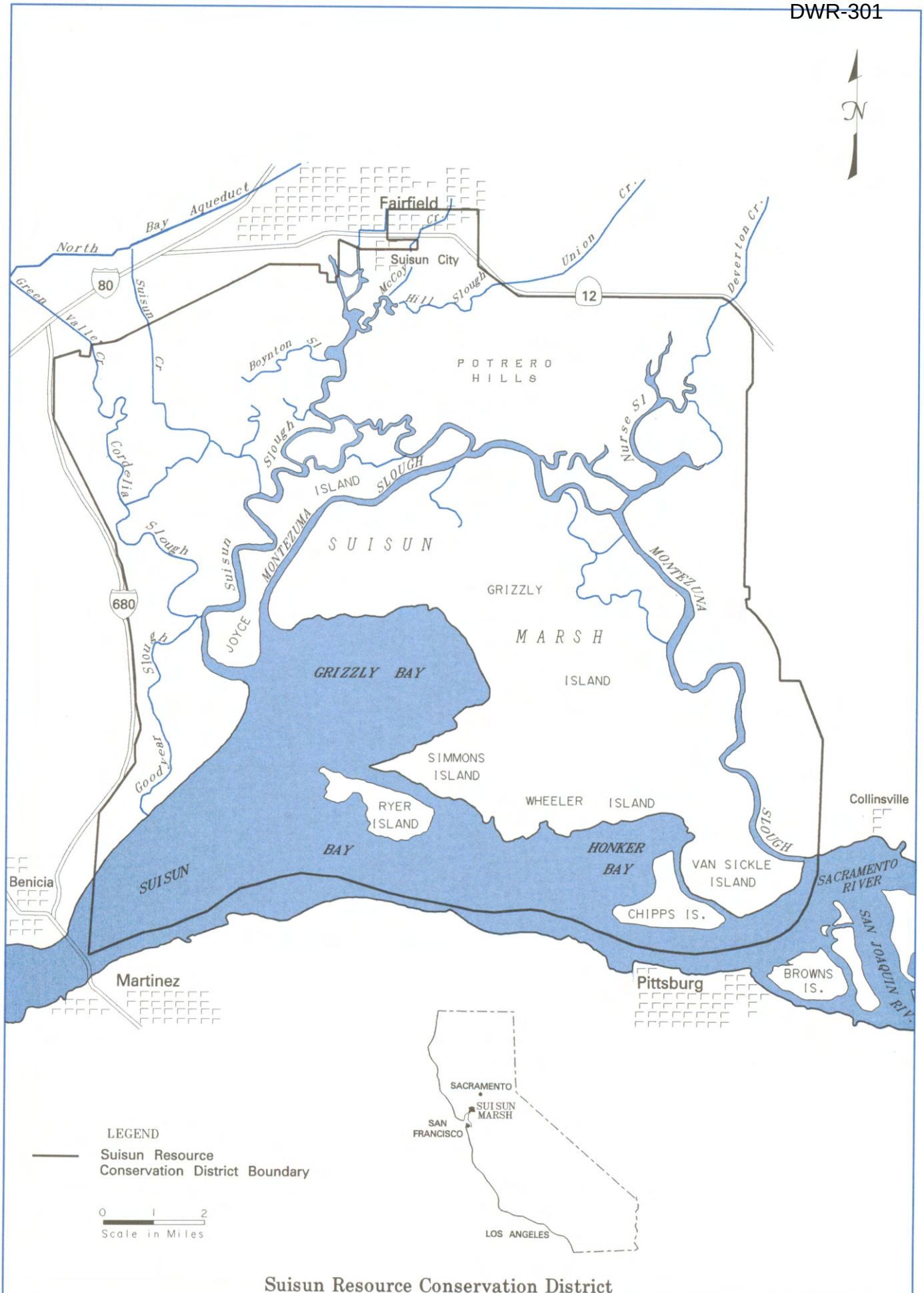


A view of the State Capitol in Sacramento.


SACRAMENTO
N
6th District
Freeport
Clarksburg
YOLO BYPASS
SACRAMENTO DEEP WATER SHIP CHANNEL
MERRITT ISLAND
RIVER
Hood
Stone Lake
Courtland
PIERSON DISTRICT
SUTTER ISLAND
Sutter Slough
Steamboat Slough
Sacramento Slough
DELTA CROSS CHANNEL
Walnut Grove
Ryde
RYER ISLAND
GRAND ISLAND
MOKELUMNE RIVER
NEW HOPE TRACT
Thornton
NORTH FORK MOKELUMNE RIVER
CANAL RANCH TRACT
BRACK TRACT
Sycamore Slough
Hog Slough
Beaver Slt
4th District
5th District
LODI
NORTH STATEN ISLAND
SOUTH STATEN ISLAND
TERMINOUS
Terminous
BOULDIN ISLAND
TYLER ISLAND
Georgiana Slough
Rio Vista
BRANNAN ISLAND
Isleton
Andrus Island
Sevenmile Slough
TWITCHELL ISLAND
SUISUN MARSH SALINITY CONTROL GATE
Collinsville
SACRAMENTO
SAN JOAQUIN
DECKER IS
Threemile Slough
WEBB TRACT
VENICE ISLAND
EMPIRE TRACT
KING ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
BISHOP TRACT
Bear Creek
SHERMAN ISLAND
VAN SICKLE ISLAND
CHIPPS IS
BROWNS IS
PITTSBURG
BRADFORD ISLAND
False River
Fisherman's Cut
FRANKS TRACT
MANDEVILLE ISLAND
MEDFORD ISLAND
Columbia Cut
Connection Slough
RINDGE TRACT
SHIMA TRACT
Eightmile Slough
JOAQUIN
BETHEL ISLAND
JERSEY ISLAND
Dutch Slough
Mound Slough
Piper Slough
Little Connection Slough
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
ANTIOCH
CONTRA COSTA CANAL
P.P. #1
HOTCHKISS TRACT
HOLLAND TRACT
Sand Rock Slough
McDONALD ISLAND
Turner Cut
LOWER ROBERTS ISLAND
BACON ISLAND
Connection Slough
Webster Cut
VEALE TRACT
PALM TRACT
OLD RIVER
Empire Cut
LOWER JONES TRACT
Whiskey Slough
STOCKTON
Burns Cutoff
7th District
Brentwood
DISCOVERY BAY
ORWOOD TRACT
Indian Slough
WOODWARD IS
Woodward Canal
North Victoria Canal
UPPER JONES TRACT
MIDDLE RIVER
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
Trapper Slough
Byron
BYRON TRACT
Victoria Canal
Old River
Connection Slough
CLIFTON COURT FOREBAY
UNION ISLAND
UPPER ROBERTS ISLAND
Grant Line Canal
Fabian and Bell Canal
FABIAN TRACT
STEWART TRACT
Paradise Cut
MANTECA
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
AQUEDUCT
SOUTH BAY PUMPING PLANT
TRACY
DELTA-MENDOTA CANAL
12th District
SACRAMENTO – SAN JOAQUIN DELTA
2 0 2 4 6
SCALE IN MILES
State Senate Districts



State Assembly Districts

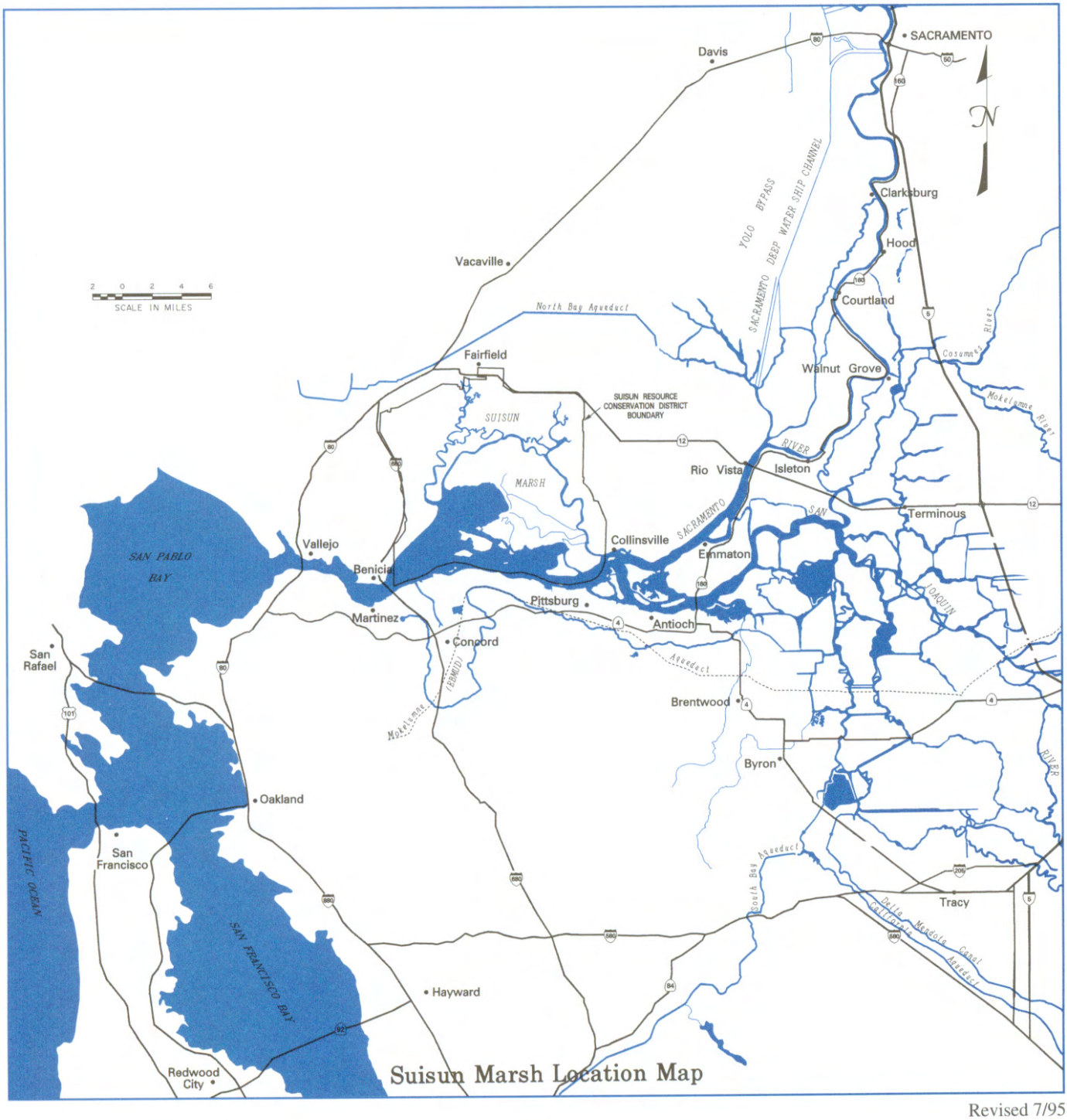


Suisun Resource Conservation District

Suisun Resource Conservation District

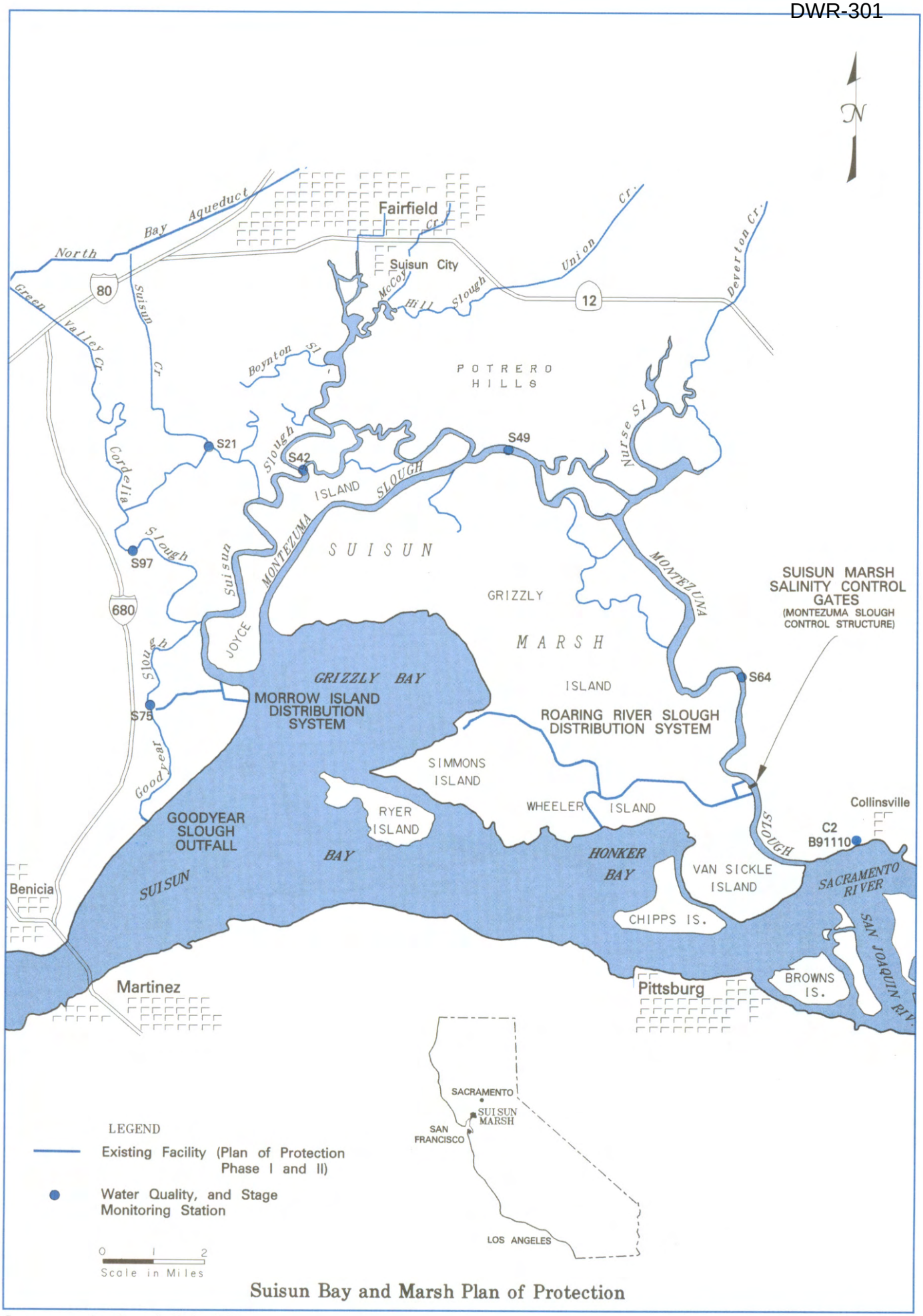
Resource Conservation Districts are authorized under the California Public Resource Code to assist the State in soil and water conservation by giving assistance to landowners and municipalities to control soil erosion and runoff, stabilize soils, and improve water quality. In 1963, local landowners in the Suisun Marsh formed the Suisun Resource Conservation District (SRCD) to protect the environmental quality of the marsh.

SRCD performs both administrative and technical functions that include representing the interests of the landowners. The District includes 116,000 acres, consisting of approximately 52,000 acres of managed wetlands, 6,300 acres of unmanaged tidal wetlands, 30,000 acres of bays and sloughs, and 27,700 acres of upland grasslands.



Suisun Marsh Location Map

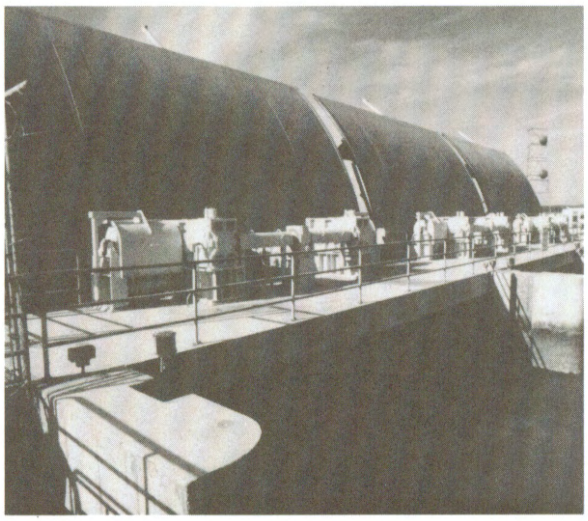
Revised 7/95



Suisun Bay and Marsh Plan of Protection

Suisun Bay and Marsh Plan of Protection

The State Water Resources Control Board issued Water Right Decision 1485 in 1978, in which the Suisun Marsh was recognized as an endangered brackish water marsh. D-1485 set channel water salinity standards, ordered the development of a water quality monitoring program, and required a Plan of Protection be implemented by October 1, 1984. In 1984, the Department of Water Resources published the Plan of Protection for the Suisun Marsh including an Environmental Impact Report, prepared in cooperation with the Department of Fish and Game, the Suisun Resource Conservation District, and the U. S. Bureau of Reclamation. The U. S. Fish and Wildlife Service also provided helpful information. The Plan of Protection is a proposal for staged implementation. Components for Phases I and II of the Plan of Protection are complete, including the Morrow Island Distribution System, Roaring River Distribution System, Goodyear Slough Outfall, and the Suisun Marsh Salinity Control Gates (also referred to as Montezuma Slough Control Structure). The locations of these facilities along with the water quality monitoring stations are shown on the map at left. DWR and USBR have begun the planning and environmental review for Phases III and IV of the Plan of Protection which focus on the western marsh.



The Suisun Marsh Salinity Control Gates began operating in 1989. Each of the three gates measures 36 feet wide by 28 feet high and operates electronically to improve water quality in the marsh.

Suisun Marsh, the largest contiguous brackish water marsh in the United States, contains 12 percent of the remaining natural wetlands in California.

Table 1
Emergency Expenditures, 1980-1986

Rec. Dist. No.	District Name	Project Levee (miles)	Nonproject Levee (miles)	Acres	Federal Disaster Nos.[1]	FEMA Expended[2] ($)	NDAA Expended[2] ($)	Local Expended ($)	Total Expended ($)	$ Per Acre
2026	Webb		12.8	5,490	3078, 651 677	14,537,483[3]	6,845,801	581,719	21,965,003	4,000
2059	Bradford		7.4	2,051	3078, 651 677	371,550	5,658,293	487,906	6,517,749	3,180
2023	Venice		12.3	3,220	3078, 651 677	6,528,288	1,491,777	825,011	8,845,076	2,750
2025	Holland		10.9	4,060	3078, 651 677	6,655,112[3]	1,836,778	176,528	8,668,418	2,140
2030	McDonald		13.7	6,145	3078, 651 677, 669	9,315,210	1,579,880	1,465,667	12,360,757	2,010
2111	Dead Horse		2.6	211	3078, 677	134,664	255,122	16,807	406,593	1,930
2065	Veale		5.7	1,298	3078, 651 677	1,555,659	714,749	45,908	2,316,316	1,780
2113	Fay		1.6	100	651, 677	102,068			102,068	1,020
563	Tyler	12.2	10.7	8,583	3078, 677 758	5,806,350	1,738,249	56,054	7,600,653	890
2037	Rindge		15.7	6,834	3078, 651 677	4,342,152	971,115	719,410	6,032,677	880
756	Bouldin		18.0	6,006	3078, 651 677	2,349,581	2,103,137	287,656	4,740,374	790
2072	Woodward		8.8	1,822	3078, 677	952,327	215,877		1,168,204	640
2038	Jones, Lower		8.8	5,894	633,651 677	2,753,768	427,632	501,870	3,683,270	620
1607	Van Sickle		3.8	1,058	651, 677	264,501	326,386	31,075	621,962	590
2041	Medford		5.9	1,219	3078, 651 677	378,793	105,597		484,390	400
2027	Mandeville		14.3	5,300	3078, 651 677	1,048,887	562,761	64,335	1,675,983	320
1601	Twitchell	2.5	9.3	3,516	3078, 677	967,881	12,178	19,537	999,596	280
2089	Stark	2.8	0.7	734	677	128,863	35,045	9,037	172,945	240
1667	Prospect	2.9	7.1	1,228	651, 677	259,955		20,705	280,660	230
38	Staten		25.4	9,173	3078, 651 677	1,652,450	201,283	89,663	1,943,396	210
2029	Empire		10.5	3,430	3078, 651 677	404,375	221,272	27,700	653,347	190
2044	King		9.0	3,260	3078, 651 677	302,043	161,109	19,239	482,391	150
2028	Bacon		14.3	5,625	3078, 677	467,443	259,121	73,651	800,215	140
2042	Bishop		5.8	2,169	3078, 677	193,646	80,799	18,040	292,485	130
2039	Jones, Upper		9.3	6,259	3078, 633 677	726,121			726,121	120
2033	Brack		10.8	4,873	3078, 651 677	296,481	166,376	60,214	523,071	110
341	Sherman	9.7	9.8	9,937	3078, 677	808,423			808,423	80
2021	Mildred		7.3	998	3078, 677	74,788			74,788	70
830	Jersey		15.6	3,471	677	69,737	65,000	41,607	176,344	50

Rec. Dist. No.	District Name	Project Levee (miles)	Nonproject Levee (miles)	Acres	Federal Disaster Nos.[1]	FEMA Expended[2] ($)	NDAA Expended[2] ($)	Local Expended ($)	Total Expended ($)	$ Per Acre
2036	Palm		7.5	2,436	3078, 677	83,307	41,226	9,132	133,665	50
800	Byron		9.7	6,933	3078	125,886	121,781	15,294	262,961	40
2024	Orwood		10.9	4,138	3078, 677	79,679	39,096	18,853	137,628	30
799	Hotchkiss		6.3	3,100	3078, 677	105,158			105,158	30
548	Terminous		16.1	10,470	3078, 651 677	162,127	56,281	38,719	257,127	20
348	New Hope		18.6	9,300	651, 677	158,456	24,890	18,192	201,538	20
—	Brannan–Andrus	19.3	10.1	13,000	3078, 677	180,733		15,926	196,659	20
544	Roberts, Upper	10.6	4.4	8,260	3078, 677	76,690	101,300	6,953	184,943	20
2040	Victoria		15.1	7,250	3078, 651 677	124,147	5,057	5,050	134,254	20
2	Union West		16.2	12,580	3078, 651 677	80,828	82,242	17,918	180,988	10
684	Roberts, Lower		16.0	10,600	3078, 651 677	119,468	21,031		140,499	10
773	Fabian		18.8	6,530	677	88,893			88,893	10
2058	Pescadero	6.7	8.3	8,500	677	50,087	7,827		57,914	10
—	Bethel		11.5	3,500	3078, 677	41,749	1,583		43,332	10
2110	McCormack–Williamson		8.8	1,654	677	22,458			22,458	10
2086	Canal Ranch		7.5	2,996	677	15,241			15,241	10
524	Roberts, Middle	6.1	3.7	13,687	3078, 677	50,536	5,460	3,885	59,881	<10
1	Union, East	1.0	13.0	9,622	18,126	677			18,126	<10
554	Walnut Grove	1.0	1.2	400	2,381	758			2,381	<10
1007	Naglee Burke		8.3	6,090	677	1,535			1,535	<10
Total		**74.8**	**499.9**	**255,010**		**65,036,084**	**26,543,111**	**5,789,261**	**97,368,456**	

[1] Federal Disaster No. 3078, February 1980; No. 633, September and October 1980; No. 651, December 1981 and January 1982; No. 669, August 1982; No. 677, November 1982 through March 1983; No. 758, February 1986.
[2] Based on information provided by the Office of Emergency Services on February 9, 1987 (FEMA – Federal Emergency Management Act, NDAA – State Natural Disaster Assistance Act).
[3] Includes funds used by the Corps of Engineers to close the 1980 levee breaks.

Table 2
Delta Levees Maintenance Subvention Program Expenditures, 1981-1993

District	Reclamation District No.	Non–Project Levee (miles)	Area (acres)	State Subventions ($)	Local Share ($)	Total ($)	No. of Years in Program	Cost Per Mile Per Year ($)
Sargent Barnhart	2074	3.5	1,214	689,641	2,200,515	2,890,156	5	165,152
McDonald	2030	13.7	6,145	4,233,774	11,314,541	15,548,315	12	94,576
Boggs	404	1.2	—	55,574	56,774	112,348	1	93,623
Bishop	2042	8.3	2,169	743,581	5,389,790	6,133,371	10	73,896
Upper Andrus	556	0.5	—	62,409	80,834	143,243	4	71,622
Holland	2025	11.0	4,060	991,382	4,754,095	5,745,477	8	65,290
Webb	2026	12.9	5,490	1,323,475	3,042,878	4,366,353	7	48,354
Brannan–Andrus	—	10.1	13,000	1,398,167	2,662,479	4,060,646	12	33,504
Holt Station	2116	0.4	5,877	14,121	9,370	23,491	2	29,364
Bouldin	756	18.0	6,006	2,072,559	2,412,014	4,484,573	9	27,683
Venice	2023	12.3	3,220	1,491,301	1,308,917	2,800,218	9	25,296
Fay	2113	1.6	100	164,086	138,993	303,079	8	23,678
Walnut Grove	554	1.0	400	26,851	36,296	63,147	3	21,049
Quimby	2090	7.0	769	574,855	596,692	1,171,547	8	20,920
Rindge	2037	15.8	6,834	1,082,879	1,396,053	2,478,932	8	19,612
Byron	800	9.7	6,933	1,052,613	1,002,728	2,055,341	11	19,263
Bacon	2028	14.3	5,625	1,652,382	1,426,387	3,078,769	12	17,942
Woodward	2072	8.8	1,822	786,747	846,260	1,633,007	11	16,870
Medford	2041	5.9	1,219	546,820	414,707	961,527	10	16,297
Tyler	563	10.7	8,583	902,292	878,289	1,780,581	11	15,128
Mandeville	2027	14.3	5,300	1,204,475	1,370,606	2,575,081	12	15,006
Prospect	1667	7.1	1,228	181,124	313,537	494,661	5	13,934
Dead Horse	2111	2.6	211	44,833	62,329	107,162	3	13,739
Palm	2036	7.6	2,436	253,642	255,888	509,530	5	13,409
Little Mandeville	2118	4.5	376	232,547	241,745	474,292	8	13,175
Weber	828	1.7	660	44,555	44,047	88,602	4	13,030
Empire	2029	10.5	3,430	400,025	681,054	1,081,079	8	12,870
Van Sickle	1607	3.8	1,058	252,919	186,494	439,413	9	12,848
Coney	2117	5.4	935	212,876	197,904	410,780	6	12,678
Twitchell	1601	9.4	3,516	680,214	724,816	1,405,030	12	12,456
Orwood	2024	6.4	4,138	315,699	401,138	716,837	9	14,445
King	2044	9.1	3,260	427,375	414,183	841,558	8	11,560
Stark	2089	0.7	734	28,488	32,651	61,139	8	10,918
Winter	2122	4.8	—	181,851	118,127	299,978	6	10,416
Wright–Elmwood	2119	7.1	2,121	329,010	187,133	516,143	7	10,385
Bethel	—	11.5	3,500	679,271	731,577	1,410,848	12	10,224

District	Reclamation District No.	Non–Project Levee (miles)	Area (acres)	State Subventions ($)	Local Share ($)	Total ($)	No. of Years in Program	Cost Per Mile Per Year ($)
Jones, Lower	2038	9.0	5,894	330,853	469,331	800,184	9	9,879
Jones, Upper	2039	8.8	6,259	173,036	236,489	409,525	5	9,307
Sherman	341	9.8	9,937	409,679	319,753	729,432	8	9,304
Hotchkiss	799	6.7	3,100	304,845	297,861	602,706	10	8,996
Victoria	2040	15.1	7,250	696,225	651,495	1,347,720	10	8,925
Rio Blanco	2114	4.2	705	110,038	177,815	287,853	8	8,567
Shima	2115	6.6	2,394	241,193	309,446	550,639	10	8,343
Roberts, Upper	544	4.4	8,260	27,560	38,564	66,124	2	7,514
McCormack-Williamson	2110	8.8	1,654	256,909	176,897	433,806	7	7,042
Canal Ranch	2086	9.6	2,996	243,588	147,440	391,028	6	6,789
Terminous	548	16.1	10,470	385,700	448,648	834,348	8	6,478
Roberts, Middle	524	3.7	13,687	10,123	13,822	23,945	1	6,472
Pescadero	2058	2.5	—	57,511	34,702	92,215	6	6,148
Staten	38	25.5	9,173	193,896	408,751	602,647	4	5,908
Union West	2	16.2	12,580	607,545	538,346	1,145,891	12	5,895
Roberts, Lower	684	16.0	10,600	405,512	443,264	848,776	9	5,894
Brack	2033	10.8	4,873	240,995	244,543	485,538	8	5,620
Naglee Burke	1007	8.3	6,090	45,044	94,644	139,688	3	5,610
Glanville	1002	13.0	—	41,088	21,096	62,184	1	4,783
Smith	1614	2.8	—	32,493	34,833	67,326	6	4,008
Union, East	1	13.0	9,622	164,151	193,258	357,409	7	3,928
New Hope	348	17.4	9,300	241,905	302,293	544,198	8	3,909
Mildred	2021	7.3	998	9,042	17,591	26,633	1	3,648
Fabian	773	18.8	6,530	14,795	51,456	66,251	1	3,524
Bradford	2059	7.4	2,051	17,422	34,478	51,900	2	3,507
Total		**535.0**	**256,792**	**30,595,561**	**51,638,659**	**82,234,220**		**1,258,206**

Table 3
Population Growth in Delta Communities, 1980-1990

City or Town	Population 1980 Census	Population 1990 Census	Percent Increase
Sacramento County			
Isleton	914	833	–8.86
Sacramento	275,741	369,365	33.95
Contra Costa County			
Antioch	42,683	62,195	45.71
Brentwood	4,434	7,563	70.57
Bethel Island	1,774	2,115	19.22
Discovery Bay	1,326	5,351	303.54
Oakley	2,816	18,374	552.49
Pittsburg	33,034	47,564	43.98
San Joaquin County			
Stockton	149,779	210,943	40.84
Tracy	18,428	33,558	82.10
Solano County			
Rio Vista	3,142	3,316	5.54
Yolo County			
West Sacramento	21,069	28,898	37.16

Note: Numbers in this table are for the entire community and may not represent the population of the portion of the community living within the statutory Delta.

Table 4
Population Characteristics for Delta Communities

City or Town	Population 1987 Atlas	Population 1990 Census	Hispanic	White	Black	American Indian	Asian	Others	Total Housing	Population/ Housing Ratio
Sacramento County										
Courtland	400	351	170	168	0	4	9	0	138	2.54
Freeport	50	38	8	28	0	1	1	0	22	1.73
Hood	300	229	95	117	0	3	14	0	96	2.39
Isleton	920	833	181	527	10	22	91	2	352	2.37
Ryde	60	49	29	20	0	0	0	0	17	2.88
Sacramento	322,500	369,365	60,007	197,157	54,609	3,492	53,185	915	153,362	2.41
Walnut Grove	1,500	870	188	484	4	12	182	0	388	2.24
Contra Costa County										
Antioch	49,250	62,195	9,719	47,454	1,563	566	2,788	105	22,973	2.71
Brentwood	NA	7,563	2,405	4,866	50	42	118	82	2,628	2.88
Byron	1,000	905	247	603	33	10	11	1	278	3.26
Discovery Bay	3,385	5,351	275	4,894	61	31	86	4	2,646	2.02
Oakley	NA	18,374	3,950	13,368	260	154	587	55	6,143	2.99
Pittsburg	40,500	47,564	11,288	22,433	8,117	276	5,363	87	16,709	2.85
San Joaquin County										
Stockton	181,600	210,943	52,653	92,029	19,118	1,463	45,239	441	72,525	2.91
Terminous	250	483	47	424	7	1	4	0	239	2.02
Thornton	850	898	501	343	5	5	44	0	272	3.30
Tracy	25,450	33,558	8,145	22,916	790	243	1,431	33	12,174	2.76
Solano County										
Hastings Tract	NA	94	69	24	0	1	0	0	22	4.27
Rio Vista	3,390	3,316	264	2,965	3	25	57	2	1,406	2.36
Yolo County										
Clarksburg	575	303	64	220	0	2	16	1	128	2.37
West Sacramento	NA	28,898	7,060	18,239	645	436	2,448	70	11,652	2.48

Note: Numbers in this table are for the entire community and may not represent the population of the portion of the community living within the statutory Delta.

Table 5
Population Characteristics for Delta Islands

Island	Population 1987 Atlas	Population 1990 Census	Hispanic	White	Black	American Indian	Asian	Others	Total Housing	Population/ Housing Ratio
Sacramento County										
Andrus/Brannan Island[1]	1,821	2,093	356	1,538	21	30	142	6	1,014	2.06
Dead Horse Island	3	39	1	38	0	0	0	0	23	1.70
Grand Island[2]	1,276	1,021	360	606	1	6	48	0	411	NA
Kimball Island	NA	0	0	0	0	0	0	0	0	NA
McCormack–Williamson Tract	NA	0	0	0	0	0	0	0	0	NA
Pierson Island[3]	NA	355	170	168	0	8	9	0	140	2.54
Sherman Island	200	233	76	152	0	0	0	0	105	2.22
Sutter Island	70	173	63	110	0	0	0	0	48	3.60
Twitchell Island	22	87	30	54	0	0	3	0	41	2.12
Tyler Island[4]	429	644	180	257	8	12	187	0	286	2.25
West Island	NA	0	0	0	0	0	0	0	0	NA
Contra Costa County										
Bethel Island	1,774	2,115	100	1,969	20	22	4	0	1,257	1.68
Bradford Island	24	0	0	0	0	0	0	0	0	NA
Browns Island	NA	0	0	0	0	0	0	0	0	NA
Byron Tract[5]	3,385	6,336	539	5559	94	42	97	5	2,964	2.14
Clifton Court Tract	NA	16	3	13	0	0	0	0	11	1.45
Coney Island	NA	0	0	0	0	0	0	0	0	NA
Holland Tract	28	35	2	32	0	0	0	1	28	1.25
Hotchkiss Tract	940	847	60	754	4	13	16	0	373	2.27
Jersey Island	9	13	0	13	0	0	0	0	3	4.33
Orwood Tract	48	98	60	33	0	3	2	0	22	4.45
Palm Tract	2	16	13	3	0	0	0	0	5	3.20
Veale Tract	16	4	1	3	0	0	0	0	2	2.00
Webb Tract	94	0	0	0	0	0	0	0	0	NA
Winter Island	NA	0	0	0	0	0	0	0	0	NA
San Joaquin County										
Bacon Island	87	260	233	9	0	0	16	2	39	6.67
Bishop Tract	6	52	15	37	0	0	0	0	23	2.26
Bouldin Island	65	74	60	0	0	0	14	0	19	3.89
Brack Tract	35	80	43	37	0	0	0	0	22	3.64
Canal Ranch Tract	NA	103	51	51	0	0	1	0	30	3.43
Empire Tract	NA	5	2	3	0	0	0	0	3	1.67
Fabian Tract	60	130	80	45	0	5	0	0	28	4.64
King Island	140	195	30	163	1	1	0	0	94	2.07
Lower Jones Tract	69	112	95	11	0	0	5	1	14	8.00
Lower Roberts Island	280	221	83	133	0	0	5	0	88	2.51

Island	Population 1987 Atlas	Population 1990 Census	Hispanic	White	Black	American Indian	Asian	Others	Total Housing	Population/ Housing Ratio
Middle Roberts Island	285	435	250	160	0	4	22	0	95	4.58
Mildred Island	3	0	0	0	0	0	0	0	0	NA
Mandeville Island	14	118	117	0	0	0	1	0	5	23.60
McDonald Island	6	95	95	0	0	0	0	0	0	NA
Medford Island	5	14	1	13	0	0	0	0	9	1.56
Naglee–Burke Tract	NA	24	4	20	0	0	0	0	5	4.80
New Hope Tract[6]	1,232	1,376	611	678	12	7	68	0	501	2.75
Pescadero Tract	NA	54	14	40	0	0	0	0	19	2.84
Rindge Tract	15	33	19	14	0	0	0	0	29	1.14
Rio Blanco Tract	NA	10	2	7	0	0	1	0	5	2.00
Rough and Ready Island	206	174	7	107	47	0	12	1	43	4.05
Sargent Barnhart Tract	60	1,902	207	1,372	85	12	224	2	806	2.36
Shima Tract	0	101	NA	NA	NA	NA	NA	NA	NA	NA
Shin Kee Tract	0	8	3	5	0	0	0	0	3	2.67
Staten Island	27	35	4	29	0	0	2	0	13	2.69
Stewart Tract	132	213	59	154	0	0	0	0	104	2.05
Terminous Tract[7]	217	602	138	450	7	1	6	0	279	2.16
Union Island	417	779	582	176	1	0	20	0	144	5.41
Upper Jones Tract	83	46	40	6	0	0	0	0	8	5.75
Upper Roberts Island	172	231	69	159	2	1	0	0	75	3.08
Venice Island	60	0	0	0	0	0	0	0	0	NA
Victoria Island	83	155	147	0	0	0	5	3	6	25.83
Woodward Island	6	6	6	0	0	0	0	0	1	6.00
Wright Elmwood Tract	9	31	21	0	0	1	9	0	0	NA
Solano County										
Chipps Island	NA	0	0	0	0	0	0	0	0	NA
Decker Island	NA	0	0	0	0	0	0	0	0	NA
Hastings Tract	52	94	69	24	0	1	0	0	22	4.27
Ryer Island	233	246	122	116	5	0	3	0	98	2.51
Van Sickle Island	NA	0	0	0	0	0	0	0	0	NA
Yolo County										
Merritt Island	226	238	54	177	1	0	6	0	97	2.45

[1] Includes City of Isleton.
[2] Includes a portion of the town of Walnut Grove and the town of Ryde.
[3] Includes town of Courtland.
[4] Includes a portion of the town of Walnut Grove.
[5] Includes the town of Byron and Discovery Bay.
[6] Includes Thornton.
[7] Includes City of Terminous.

Table 6
Improvements on Delta Islands

Rec. Dist. No.	District Name	Project Levee (miles)	Nonproject Levee (miles)	Acres	Railroads	Public Roads	Utilities	Cities, Towns, Urban	Recreation Resorts
2028	Bacon		14.3	5,625		x	x		
—	Bethel		11.5	3,500		x	x	x	x
2042	Bishop		5.8	2,169					x
404	Boggs (Moss Tract)	4.0	1.2	2,550					x
756	Bouldin		18.0	6,006		x	x	x	x
2033	Brack		10.8	4,873		x			
2059	Bradford		7.4	2,051			x		
—	Brannan-Andrus	19.3	10.1	13,000		x	x	x	x
—	Browns Island								
800	Byron		9.7	6,933		x	x	x	x
2086	Canal Ranch		7.5	2,996		x			
—	Chipps Island								
2117	Coney		5.4	935					
2111	Dead Horse		2.6	211					
—	Decker Island			630					
2029	Empire		10.5	3,430		x	x		x
773	Fabian		18.8	6,530		x			x
2113	Fay		1.6	100					
1002	Glanville		13.0	7,000					x
3	Grand Island	29.0		17,010					
2060	Hastings Tract	16.0		7,150		x	x	x	x
2025	Holland		10.9	4,060		x			x
2116	Holt Station		0.4	37					
799	Hotchkiss		6.3	3,100		x	x	x	x
830	Jersey		15.6	3,471		x	x		
2038	Jones, Lower		8.8	5,894	x	x	x		x
2039	Jones, Upper		9.3	6,259		x	x		x
2044	King		9.0	3,260		x	x		x
2118	Little Mandeville		4.5	376					
2027	Mandeville		14.3	5,300					
2110	McCormack-Williamson		8.8	1,654			x		
2030	McDonald		13.7	6,145			x		
2041	Medford		5.9	1,219					
150	Merritt Island	18.1		4,740		x			x
2021	Mildred		7.3	998					
2107	Mossdale 2	4.2		1,230	x	x	x	x	x
1007	Naglee Burke		8.3	6,090	x	x	x		
348	New Hope		18.6	9,300	x	x	x	x	x
2024	Orwood		10.9	4,138	x	x	x		x
2036	Palm		7.5	2,436			x		

Rec. Dist. No.	District Name	Project Levee (miles)	Nonproject Levee (miles)	Acres	Railroads	Public Roads	Utilities	Cities, Towns, Urban	Recreation Resorts
2058	Pescadero	6.7	2.2	8,680		x	x	x	
551	Pierson District			8,980					
1667	Prospect	2.9	7.1	1,228					
2090	Quimby		7.0	769			x		
2037	Rindge		15.7	6,834					
2114	Rio Blanco		4.0	705					
684	Roberts, Lower		16.0	10,600	x		x		x
524	Roberts, Middle	6.1	3.7	13,687	x	x	x		
544	Roberts, Upper	10.6	4.4	8,260		x	x		
—	Rough and Ready Island			1,430					
501	Ryer Island	20.6		11,880		x			x
2074	Sargent Barnhart	1.5	2.8	1,214		x	x		
341	Sherman	9.7	9.8	9,937		x	x		x
2115	Shima		6.6	2,394		x	x		
—	Shin Kee			1,016		x	x		x
1614	Smith		2.8	1,940					x
2089	Stark	2.8	0.7	734		x			
38	Staten		25.4	9,173		x	x		
2062	Stewart	12.3		3,910	x	x			x
349	Sutter Island	12.5		2,620		x			x
548	Terminous		16.1	10,470		x	x	x	x
1601	Twitchell	2.5	9.3	3,516		x	x		x
563	Tyler	12.2	10.7	8,583		x	x		x
1	Union, East	1.0	13.0	9,622		x	x		
2	Union, West		16.2	12,580		x	x		
556	Upper Andrus	11.2	0.5	2,450	x	x			x
1607	Van Sickle		3.8	1,058					
2065	Veale		5.7	1,298		x	x		
2023	Venice		12.3	3,220					
2040	Victoria		15.1	7,250		x	x		
554	Walnut Grove	1.0	1.2	400		x	x	x	x
2026	Webb		12.8	5,490					
828	Weber		1.2	660		x	x		
2122	Winter		4.8	453					
2072	Woodward		8.8	1,822			x		
2119	Wright-Elmwood		6.8	2,121		x	x		
Total		**211**	**554.8**	**338,981**					

Table 7
Delta Statistics

DEMOGRAPHY

Population: 410,000 (1990)
Counties: Alameda, Contra Costa, Sacramento, San Joaquin, Solano, Yolo
Incorporated Cities Entirely Within the Delta: Antioch, Brentwood, Isleton, Pittsburg, Tracy
Major Cities Partly Within the Delta: Sacramento, Stockton, West Sacramento
Unincorporated Towns and Villages: 14

GEOGRAPHY

Area (acres, 1991):

Agriculture	538,000
Cities and Towns	64,000
Water Surface	61,000
Undeveloped	75,000
Total Acres	**738,000**

Levees (miles, 1987):

Project	165
Direct Agreement	110
Non-project	825
Total Miles	**1,100**

Rivers Flowing into the Delta: Sacramento, San Joaquin, Mokelumne, Cosumnes, Calaveras (These rivers plus their tributaries carry 47 percent of the State's total runoff.)

Diversions Via Aqueducts Through or Around the Delta:
San Francisco Public Utilities Commission
East Bay Municipal Utility District

Diversions Directly From the Delta:
Western Delta Industry
City of Vallejo
1,800+ Agricultural Users
Contra Costa Canal
State Water Project
Central Valley Project

ECONOMY

Recreation:

User days annually	12,000,000
Registered Pleasure Boats	82,000
Commercial Recreation Facilities	120
Public Recreation Facilities	20
Private Recreation Associations	20
Berths	8,500
Docks	120
Launch Facilities	30

Transportation: Interstate Highways: 5, 80, 205,
State Highways: 4, 12, 160
Railroads: Southern Pacific, Union Pacific, Atchison, Topeka & Santa Fe, Sacramento Northern
Deepwater Ship Channels to Sacramento and Stockton transport 5 million tons of cargo annually.

Agriculture (1990):
Average Annual Gross Value = Over $500 million
Main crops: Corn, Grain and Hay, Sugarbeets, Alfalfa, Pasture, Tomatoes, Asparagus, Fruit, Safflower

FISH AND WILDLIFE

Birds	230 species	Reptiles and Amphibians	25 species
Mammals	45 species	Flowering plants	150 species
Fish	52 species		

Major Anadromous Fish: Salmon, Striped Bass, Steelhead Trout, American Shad, Sturgeon

Related Materials

1. Delta Statutes
2. Selected References
3. Time Line of Delta Events
4. Species of Concern
5. Non-Native Species
6. Legislators

Delta Statutes

Selected California Statutes that deal specifically with the Delta

State Water Resources Development Bond Act

The State Water Resources Development Bond Act (also known as the Burns-Porter Act) ratified at the General Election, November 8, 1960, authorized the sale of $1,750,000 of general obligation bonds to assist in financing the initial facilities of the State Water Resources Development System which are now known as the State Water Project. The facilities of the State Water Project are described in Water Code Section 12934(d). The pertinent provisions relating to the Sacramento-San Joaquin Delta are:

(2) An aqueduct system which will provide for the transportation of water from a point or points at or near the Sacramento-San Joaquin Delta to termini in the Counties of Marin, Alameda, Santa Clara, Santa Barbara, Los Angeles and Riverside, and for delivery of water both at such termini and at canal-side points enroute, for service in Solano, Napa, Sonoma, Marin, Alameda, Contra Costa, Santa Clara, San Benito, Santa Cruz, Fresno, Tulare, Kings, Kern, Los Angeles, Ventura, San Bernardino, Riverside, Orange, San Diego, San Luis Obispo, Monterey and Santa Barbara Counties.

Said aqueduct system shall consist of intake and diversion works, conduits, tunnels, siphons, pipelines, dams, reservoirs, and pumping facilities, and shall be composed of a North Bay aqueduct extending to a terminal reservoir in Marin County; a South Bay aqueduct extending to terminal reservoirs in the Counties of Alameda and Santa Clara; a reservoir near Los Banos in Merced County; a Pacheco Pass Tunnel aqueduct from a reservoir near Los Banos in Merced County to a terminus in Pacheco Creek in Santa Clara County; a San Joaquin Valley-Southern California aqueduct extending to termini in the vicinity of Newhall, Los Angeles County, and Perris, Riverside County, and having a capacity of not less than 2,500 cubic feet per second at all points north of the northerly boundary of the County of Los Angeles in the Tehachapi Mountains in the vicinity of Quail Lake and a capacity of not less than 10,000 cubic feet per second at all points north of the initial offstream storage reservoir; a coastal aqueduct beginning on the San Joaquin Valley-Southern California aqueduct in the vicinity of Avenal, Kings County, and extending to a terminal at the Santa Maria River;

(3) Master levees, control structures, channel improvements, and appurtenant facilities in the Sacramento-San Joaquin Delta for water conservation, water supply in the Delta, transfer of water across the Delta, flood and salinity control, and related functions.

(Added by Stats. 1959, Ch. 1762.)

Watershed Protection Law

Water Code Sections 11460 to 11463 set forth restrictions and limitations to protect the reasonable water requirements of water needs of the watershed wherein water originates. The Burns-Porter Act (Water Code Section 12931) declares the Delta to be part of the Sacramento River watershed.

11460. In the construction and operation by the department of any project under the provisions of this part a watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall not be deprived by the department directly or indirectly of the prior right to all of the water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein.

(Amended by Stats. 1957, Ch. 1932. Note: Amendment by Stats. 1980, Ch. 632, did not take effect; Ch. 632 was rejected by referendum as Prop. 9 on June 8, 1982.)

11460. In no other way than by purchase or otherwise as provided in this part shall water rights of a watershed, area, or the inhabitants be impaired or curtailed by the department, but the provisions of this article shall be strictly limited to the acts and proceedings of the department, as such, and shall not apply to any persons or state agencies.

(Amended by Stats. 1957, Ch. 1932.)

11462. The provisions of this article shall not be so construed as to create any new property rights other than against the department as provided in this part or to require the department to furnish to any person without adequate compensation therefor any water made available by the construction of any works by the department.

(Amended by Stats. 1957, Ch. 1932.)

11463. In the construction and operation by the department of any project under the provisions of this part, no exchange of the water of any watershed or area for the water of any other watershed or area may be made by the department unless the water requirements of the watershed or area in which the exchange is made are first and at all times met and satisfied to the extent that the requirements would have been met were the exchange not made, and no right to the use of water shall be gained or lost by reason of any such exchange.

(Amended by Stats. 1957, Ch. 1932.)

Delta Protection Act

The Delta Protection Act was enacted in 1959 at the same session of the Legislature at which the Burns-Porter Act was enacted.

12200. The Legislature hereby finds that the water problems of the Sacramento-San Joaquin Delta are unique within the State; the Sacramento and San Joaquin Rivers join at the Sacramento-San Joaquin Delta to discharge their fresh water flows into Suisun, San Pablo and San Francisco Bays and thence into the Pacific Ocean; the merging of fresh water with saline bay waters and drainage waters and the withdrawal of fresh water for beneficial uses creates an acute problem of salinity intrusion into the vast network of channels and sloughs of the Delta; the State Water Resources Development System has as one of its objectives the transfer of waters from water-surplus areas in the Sacramento Valley and the north coastal area to water-deficient areas to the south and west of the Sacramento-San Joaquin Delta via the Delta; water surplus to the needs of the areas in which it originates is gathered in the Delta and thereby provides a common source of fresh water supply for water-deficient areas. It is, therefore, hereby declared that a general law cannot be made applicable to said Delta and that the enactment of this law is necessary for the protection, conservation, development, control and use of the waters in the Delta for the public good.

(Added by Stats. 1959, Ch. 1766.)

12201. The Legislature finds that the maintenance of an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta area as set forth in Section 12220, Chapter 2, of this part, and to provide a common source of fresh water for export to areas of water deficiency is necessary to the peace, health, safety and welfare of the people of the State, except that delivery of such water shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code.

(Added by Stats. 1959, Ch. 1766.)

12202. Among the functions to be provided by the State Water Resources Development System, in coordination with the activities of the United States in providing salinity control for the Delta through operation of the Federal Central Valley Project, shall be the provision of salinity control and an adequate water supply for the users of water in the Sacramento-San Joaquin Delta. If it is determined to be in the public interest to provide a substitute water supply to the users in said Delta in lieu of that which would be provided as a result of salinity control no added financial burden shall be placed upon said Delta water users solely by virtue of such substitution. Delivery of said substitute water supply shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code.

(Added by Stats. 1959, Ch. 1766.)

12203. It is hereby declared to be the policy of the State that no person, corporation or public or private agency or the State or the United States should divert water from the channels of the Sacramento-San Joaquin Delta to which the users within said Delta are entitled.

(Added by Stats. 1959, Ch. 1766.)

12204. In determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements of Sections 12202 and 12203 of this chapter.

(Added by Stats. 1959, Ch. 1766.)

12205. It is the policy of the State that the operation and management of releases from storage into the Sacramento-San Joaquin Delta of water for use outside the area in which such water originates shall be integrated to the maximum extent possible in order to permit the fulfillment of the objectives of this part.

(Added by Stats. 1959, Ch. 1766.)

Sacramento-San Joaquin Delta Levees

The State in 1976 adopted a conceptual plan for improvement of Delta levees which is contained in Water Code Chapter 3, Sections 12225 to 12227.

12225. The plan for improvement of the Sacramento-San Joaquin Delta levees, as set forth in Bulletin No. 192 of the Department of Water Resources, dated May 1975, is approved as a conceptual plan to guide the formulation of projects to preserve the integrity of the delta levee system.

(Added by Stats. 1976, Ch. 1302.)

12226. The department may prepare detailed plans and specifications for the improvement of the levees or levee segments specified in Section 12225.

(Added by Stats. 1976, Ch. 1302.)

12226.1. The department shall report on its recommendations to the Legislature concerning the improvement of the levees specified in Section 12225, including, but not limited to, recommendations concerning construction, cost sharing, land use, zoning, flood control, recreation, fish and wildlife habitat, and aesthetic values. The department shall submit interim reports to the Legislature concerning the status of the delta levees program on or before January 15 of each year beginning in 1978, with the final report on its recommendations to be made on or before January 15, 1980.

(Added by Stats. 1976, Ch. 1302.)

12226.2. The department may proceed immediately with the improvement of a pilot levee project which the department determines, after a public hearing, is in critical need of improvement and which is highly susceptible to failure in the absence of such immediate improvement. Prior to commencing such improvement, the department shall enter into an agreement with a local agency whereby the local agency will bear at least 20 percent of the cost of the improvement.

(Added by Stats. 1976, Ch. 1302.)

12227. This chapter shall be known and may be cited as the "Nejedly-Mobley Delta Levees Act".

(Added by Stats. 1976, Ch. 1302.)

Environmental Mitigation and Protection Requirements

The following sections were added to the Water Code in 1991 to establish coordination between The Resources Agency, the Department of Water Resources, The Reclamation Board, and the Department of Fish and Game to assure that flood protection activities result in no net loss of riparian, wildlife, or fishery habitat.

12306. This chapter applies to special flood control projects subject to Chapter 2 (commencing with Section 12310) and to the payment of delta levee subventions under Part 9 (commencing with Section 12980).

(Added by Stats. 1991, Ch. 1140, Sec. 1.)

12306.5. The Resources Agency shall supervise the implementation of the programs subject to this chapter.

(Added by Stats. 1991, Ch. 1140, Sec. 1.)

12307. (a) The Resources Agency, the department, the Reclamation Board, and the Department of Fish and Game shall enter into a memorandum of understanding to coordinate the implementation of the programs subject to this chapter.

(b) The memorandum of understanding shall provide that the Department of Fish and Game shall enforce any mitigation requirements involving programs subject to this chapter.

(Added by Stats. 1991, Ch. 1140, Sec. 1.)

12308. The Resources Agency shall report to the Legislature not later than January 15 of each year all of the following information for each plan approved pursuant to this part:

(a) The name of each local agency submitting a plan, the island or tract involved, and a map of the island or tract indicating the work and the mitigation sites.

(b) The amount of money allocated to the plan, and the amount of money spent on project construction and on project mitigation.

(c) The number of acres of riparian, wildlife, and fisheries habitat and the number of lineal feet of shaded aquatic areas disturbed by projects funded under this part.

(d) The number and quality of acres of replacement habitat provided as mitigation.

(e) An annual assessment as to whether the cumulative impact of projects funded pursuant to this part has resulted in no net long-term loss of riparian, wildlife, or fisheries habitat. If the Resources Agency determines that a net long-term loss has occurred, it shall include in its assessment the necessary steps to correct those deficiencies.

(Added by Stats. 1991, Ch. 1140, Sec. 1.)

Delta Flood Protection Act of 1988

This act created the Special Flood Control Project Program for the eight islands in the western Delta (Bethel, Bradford, Holland, Hotchkiss, Jersey, Sherman, Twitchell, and Webb) and the communities of Thornton and Walnut Grove. It also amended the Delta Levee Maintenance Subvention Program which was established in 1973 to provide State financial assistance to local districts for maintaining and improving nonproject Delta levees. Finally, the act created a special account in the California Water Fund for appropriation by the Legislature to the Department of Water Resources for fish, wildlife, and water quality mitigation activities in the Delta, Suisun Marsh, and San Francisco Bay. Sections of the Water Code pertaining to the Special Flood Control Project Program and the Delta Levee Maintenance Subvention Program follow.

Special Flood Control Project Program

12310. As used in this chapter, the following terms have the following meanings:

(a) "Local public agency" means a reclamation district or levee district or other public agency responsible for the maintenance of a nonproject levee as defined in subdivision (d) of Section 12980.

(b) "Project" means the flood control improvement constructed or interests in land acquired pursuant to this chapter.

(c) "Department" means the Department of Water Resources.

(d) "Delta" means the Sacramento-San Joaquin Delta as described in Section 12220.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

12311. (a) The department shall develop and implement a program of flood control projects on Bethel, Bradford, Holland, Hotchkiss, Jersey, Sherman, Twitchell, and Webb Islands in the delta and for the Towns of Thornton and Walnut Grove. This program shall have, as its primary purpose, the protection of discrete and identifiable public benefits, including the protection of public highways and roads, utility lines and conduits, and other public facilities, and the protection of urbanized areas, water quality, recreation, and other public benefits.

(b) Notwithstanding subdivision (a), the department shall develop and recommend a plan of action, including alternatives, for flood control for the Towns of Thornton and Walnut Grove and shall submit the plan to the Legislature by January 1, 1989. The department shall not allocate any funds for implementation of the plan of action for flood control for the Towns of Thornton and Walnut Grove until a plan is approved by the Legislature.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

12312. The department may expend any moneys available to it pursuant to paragraph (2) of subdivision (b) of Section 12300 for the purposes of this chapter. In addition, the department shall seek a sharing of costs with the beneficiaries or owners or operators of the public facilities benefited by the flood protection projects. The department shall also seek cost sharing with, or financial assistance from, federal agencies which have programs applicable to, or which have an interest in, the flood protection projects.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

12313. (a) The department shall develop a list of areas where flood control work is needed to protect public facilities or

provide public benefits. In developing the list, the department shall consult with all appropriate federal, state, and local agencies. The list shall establish a priority for the areas based upon both of the following:

(1) The importance or degree of public benefit needing protection.

(2) The need for flood protective work.

(b) The list shall be submitted to the California Water Commission for approval, and shall be updated by the department, with the approval of the California Water Commission, as the department may deem appropriate.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

12314. Guided by the approved priority list developed pursuant to Section 12313, the department shall develop project plans to accomplish the needed flood protection work, in cooperation with the local public agency, the public beneficiary, and the Department of Fish and Game.

The plans shall be subject to the approval of the appropriate local public agency or agencies and subject to any cost-sharing agreement the department may have entered into under Section 12312. Project plans may include, or be a combination of, the improvement, rehabilitation, or modification of existing levees and the conveyance of interests in land to limit or to modify land management practices which have a negative impact on flood control facilities.

Project plans shall include provision for the protection of fish and wildlife habitat determined to be necessary by the Department of Fish and Game and not injurious to the integrity of flood control works. The Department of Fish and Game shall consider the value of the riparian and fisheries habitat and the need to provide greater flood protection in preparing its requirements, and shall not approve any plan which calls for the use of channel islands or berms with significant riparian communities as borrow sites for levee repair materials, unless fully mitigated, or any plans which will result in a net long-term loss of riparian, fisheries, or wildlife habitat.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

12315. Projects shall be undertaken and completed in accordance with the approved project plans. Project works may be undertaken by the department or, at the department's option, by the local public agency pursuant to an agreement with the department.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

12316. In addition to any obligations assumed under an agreement with the department and to the extent consistent with that agreement, the local public agency shall do all of the following:

(a) Provide construction access to lands or rights-of-way which it owns or maintains for flood control purposes or for purposes with which the project's required uses are compatible and necessary to complete the project.

(b) Maintain the completed project.

(c) Apply for federal disaster assistance, whenever eligible, under Public Law 93-288.

(d) Hold and save the department, any other agency or department of the state, and their employees free from any and all liability for damages, except that caused by gross negligence, that may arise out of the construction, operation, or maintenance of the project.

(e) Acquire easements up to 400 feet in width from the crown along levees in areas where the department determines that such an easement is desirable to maintain structural stability of the levee. The easement shall (1) restrict the use of the land to open-space uses with minimum tillage of the soil, including, without limitation, nontillable crops such as pasture, the propagation of wildlife habitat, and other compatible uses, (2) provide full access to the local agency for levee maintenance and improvement purposes, and (3) allow the owner to retain reasonable rights of ingress and egress as well as reasonable rights of access to the waterways for water supply and drainage. The local public agency costs of acquisition of the easements shall be reimbursable by the department from moneys appropriated pursuant to paragraph (2) of subdivision (b) of Section 12300.

(f) Comply with all mitigation requirements required pursuant to this chapter.

(Added by Stats. 1988, Ch. 28, Sec. 3. Effective March 14, 1988.)

Delta Levee Maintenance Subvention Program

In 1973, the Legislature passed Senate Bill 541 (also known as the Way Bill, Chapter 717, Statutes of 1973), which establishes this program. It was amended by the Delta Flood Protection Act of 1988.

12980. As used in this part:

(a) "Board" means the Reclamation Board.

(b) "Delta" means the Sacramento-San Joaquin Delta as described in Section 12220.

(c) "Local agency" means any city, county, district, or other political subdivision of the state which is authorized to maintain levees.

(d) "Nonproject levee" means a levee in the delta which is not a project facility under the State Water Resources Law of 1945.

(Added by Stats. 1973, Ch. 717.)

12981. The Legislature hereby finds and declares that the delta is endowed with many invaluable and unique resources and that these resources are of major statewide significance. The Legislature further finds and declares that the delta's uniqueness is particularly characterized by its hundreds of miles of meandering waterways and the many islands adjacent thereto; that, in order to preserve the delta's invaluable resources, which include highly productive agriculture, recreational assets, fisheries, and wildlife environment, the physical characteristics of the delta should be preserved essentially in their present form; and that the key to preserving the delta's physical characteristics is the system of levees defining the waterways and producing the adjacent islands. However, the Legislature recognizes that it may not be economically justifiable to maintain all delta islands.

(Amended by Stats. 1985, Ch. 1271, Sec. 3.)

12982. The Legislature further finds and declares that while

most of the delta's levees are privately owned and maintained they are being subjected to varied multiple uses and serve to benefit many varied segments and interests of the public at large, and that as a result of the varied multiple uses of such levees, added maintenance costs are being borne by adjacent landowners.

(Added by Stats. 1973, Ch. 717.)

12983. The Legislature further finds and declares that there is an urgent need for a higher degree of levee maintenance and rehabilitation generally throughout the delta and that the state has an interest in providing technical and financial assistance for delta levee maintenance and rehabilitation.

The Legislature also finds and declares that, because of the instability of delta soils, the effect of winds, tides, and floodflows, and the unique problems of erosion, seepage, and subsidence, the same security against levee failure and flooding cannot be achieved by protective works in the delta as in areas less vulnerable to these problems. Although the rehabilitation and maintenance of delta levees is an important undertaking, a significant risk of levee failure will still persist.

The purpose of the state's approval of plans and inspection of works, which duties are set forth in this part, is to ensure that subvention funds are properly expended and that delta levees are effectively rehabilitated and maintained, and the state does not thereby assume any responsibility for the safety of any delta levee against failure.

(Amended by Stats. 1986, Ch. 824, Sec. 1. Effective September 15, 1986.)

12984. The department shall develop and submit to the board, for adoption by the board, criteria for the maintenance and improvement of nonproject levees. The criteria shall vary as required to meet specific conditions and shall be multipurpose in nature, and include environmental considerations, when feasible. The criteria shall embody and implement the short-term mitigation plan set forth in the "Flood Hazard Mitigation Plan for the Sacramento-San Joaquin Delta," prepared by the department for the Office of Emergency Services, dated September 15, 1983, and as it may be subsequently amended.

(Amended by Stats. 1986, Ch. 824, Sec. 2. Effective September 15, 1986.)

12985. Prior to adoption of any such criteria, the board shall hold public hearings and may revise the criteria as it determines necessary.

(Added by Stats. 1973, Ch. 717.)

12986. (a) It is the intention of the Legislature to reimburse an eligible local agency pursuant to this part for costs incurred in any year for the maintenance or improvement of nonproject levees as follows:

(1) No costs incurred shall be reimbursed if the entire cost incurred per mile of nonproject levee is one thousand dollars ($1,000) or less.

(2) Seventy-five percent of any costs incurred in excess of one thousand dollars ($1,000) per mile of nonproject levee shall be reimbursed.

(b) This section shall remain in effect only until January 1, 1999, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1999, deletes or extends that date.

(Amended by Stats. 1988, Ch. 28, Sec. 5. Effective March 14, 1988. Repealed as of January 1, 1999, by its own provisions. See later operative version, as added by Stats. 1988, Ch. 28, Sec. 6.)

12986. (a) It is the intention of the Legislature to reimburse from the General Fund an eligible local agency pursuant to this part for costs incurred in any year for the maintenance or improvement of nonproject levees as follows:

(1) No costs incurred shall be reimbursed if the entire cost incurred per mile of levee is one thousand dollars ($1,000) or less.

(2) Fifty percent of any costs incurred in excess of one thousand dollars ($1,000) per mile of levee shall be reimbursed.

(3) The maximum total reimbursement from the General Fund shall not exceed two million dollars ($2,000,000) annually.

(b) This section shall become operative on January 1, 1999.

(Repealed (by Sec. 5) and added by Stats. 1988, Ch. 28, Sec. 6. Effective March 14, 1988. Operative January 1, 1999, by its own provisions.)

12987. Local agencies maintaining nonproject levees shall be eligible for reimbursement pursuant to this part upon submission to and approval by the board of plans for the maintenance and improvement of the nonproject levees, including plans for the annual routine maintenance of the levees, in accordance with the criteria adopted by the board.

The plans shall also be compatible with the plan for improvement of the delta levees as set forth in Bulletin No. 192-82 of the department, dated December 1982, and as approved in Section 12225, and shall include provisions to acquire easements up to 400 feet in width from the crown along levees in areas where the department determines that such an easement is desirable to maintain structural stability of the levee. The easement shall (1) restrict the use of the land to open-space uses with minimum tillage of the soil, including, without limitation, nontillable crops such as pasture, the propagation of wildlife habitat, and other compatible uses, (2) provide full access to the local agency for levee maintenance and improvement purposes, and (3) allow the owner to retain reasonable rights of ingress and egress as well as reasonable rights of access to the waterways for water supply and drainage. The local agency cost of acquisition of the easements shall be reimbursable by the department from moneys appropriated pursuant to paragraph (1) of subdivision (b) of Section 12300. The plans shall also include provision for protection of the fish and wildlife habitat determined to be necessary by the Department of Fish and Game and not injurious to the integrity of the levee. The Department of Fish and Game shall consider the value of the riparian and fisheries habitat and the need to provide safe levees in preparing its requirements. The Department of Fish and Game shall not approve any plan which calls for the use of channel islands or berms with significant riparian communities as borrow sites for levee repair material, unless fully mitigated, or any plans which will result in a net long-term loss of riparian, fisheries, or wildlife habitat.

The plans shall also take into account the most recently updated Delta Master Recreation Plan prepared by the Resources Agency.

Upon approval of the plans by the board, the local agencies

shall enter into an agreement with the board to perform the maintenance and improvement work, including the annual routine maintenance work, specified in the plans. If applications for state funding in any year exceed the state funds available, the board shall apportion the funds among those levees or levee segments that are identified by the department as most critical and beneficial, considering the needs of flood control, water quality, recreation, and wildlife.

(Amended by Stats. 1988, Ch. 28, Sec. 7. Effective March 14, 1988.)

12987.5. (a) In an agreement entered into under Section 12987, the board may provide for an advance to the applicant in an amount not to exceed 75 percent of the estimated state share. The agreement shall provide that no advance shall be made until the applicant has incurred costs averaging one thousand dollars ($1,000) per mile of levee.

(b) Advances made under subdivision (a) shall be subtracted from amounts to be reimbursed after the work has been performed. If the department finds that work has not been satisfactorily performed or where advances made actually exceed reimbursable costs, the local agency shall promptly remit to the state all amounts advanced in excess of reimbursable costs. If advances are sought, the board may require a bond to be posted to ensure the faithful performance of the work set forth in the agreement.

(c) This section shall remain in effect only until January 1, 1999, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1999, deletes or extends that date.

(Added by Stats. 1988, Ch. 28, Sec. 8. Effective March 14, 1988. Repealed as of January 1, 1999, by its own provisions.)

12988. Upon the completion in any year of the maintenance or improvement work, including annual routine maintenance work, as specified in the plans approved by the board, the local agency shall notify the department, and the department shall inspect the completed work. The department, upon completion of such inspection, shall submit to the board a report as to its findings. Upon a finding that the work has been satisfactorily completed in accordance with the approved plans, the board shall certify for reimbursement any costs incurred in excess of five hundred dollars ($500) per mile of levee, if the entire cost incurred per mile of levee is not in excess of one thousand dollars ($1,000), and shall certify for reimbursement 50 percent of any costs incurred per mile of levee if the entire cost incurred per mile of levee is greater than one thousand dollars ($1,000).

(Added by Stats. 1973, Ch. 717.)

12989. The department shall conduct at least one annual inspection of every levee for which maintenance or improvement costs have been reimbursed pursuant to this part. In addition, the department shall inspect nonproject levees of local agencies for the purpose of monitoring and ascertaining the degree of compliance with, or progress toward meeting, the standards in the Flood Hazard Mitigation Plan, as set forth in Section 12984.

The local agency shall cooperate with the department in the conduct of these inspections, including the provision of reasonable access over local agency lands and easements.

(Amended by Stats. 1986, Ch. 824, Sec. 3. Effective September 15, 1986.)

12990. Whenever the department finds that the annual routine maintenance work specified in the plans approved by the board is not being performed in accordance with the agreement entered into between the local agency and the board, the department may establish a maintenance area in accordance with the provisions of Chapter 4.5 (commencing with Section 12878) of Part 6 of this division, as nearly as the same may be applicable, except that the work to be performed shall be the routine annual maintenance work for the nonproject levee as specified in the plans approved by the board. Upon the formation of a maintenance area, the department shall thereafter annually maintain the nonproject levee in accordance with such plans and subject to the provisions of Chapter 4.5 (commencing with Section 12878) of Part 6 of this division, as nearly as the same may be applicable.

(Added by Stats. 1973, Ch. 717.)

12991. The board is authorized to make, from time to time, such rules and regulations as may be necessary to carry out, and as are consistent with, this part.

(Added by Stats. 1973, Ch. 717.)

12992. Before any plan is approved, agreement entered into, or moneys advanced or reimbursed under this part, the local agency shall first enter into an agreement with the board indemnifying and holding and saving the State of California, the board, the department, any other agency or department of the state, and their employees free from any and all liability for damages, except that caused by gross negligence, that may arise out of the approvals, agreements, inspections, or work performed under this part.

Any funds appropriated for any of the purposes of this part may be used to satisfy any judgment against the state covered by this section, pending indemnification by the local agency.

(Added by Stats. 1988, Ch. 28, Sec. 9. Effective March 14, 1988.)

12993. Applicants shall apply for federal disaster assistance, whenever eligible, under Public Law 93-288. If, and to the extent that, it is determined that the work performed does not qualify for federal disaster assistance, the applicant may apply for reimbursement under Section 12986, and the costs shall be deemed incurred by the applicant in the year in which the latter application is filed.

(Added by Stats. 1988, Ch. 28, Sec. 10. Effective March 14, 1988.)

Delta Protection Act of 1992

This act, incorporated into the Public Resources Code (Section 21080.22 and Division 19.5), establishes the Delta Protection Commission and specifies its duties and powers. The Commission is to develop a comprehensive long-term resources management plan for the Delta by July 1, 1994, and is to be abolished on January l, 1997. The Delta primary zone, the area to which the resource management plan will apply, is shown on the map titled Delta Primary and Secondary Zones.

SECTION 1. Section 21080.22 is added to the Public Resources Code, to read:

21080.22. (a) This division does not apply to activities and approvals by a local government necessary for the preparation of general plan amendments pursuant to Section 29763, except that the approval of general plan amendments by the Delta Protection Commission is subject to the requirements of this division.

(b) For purposes of Section 21080.5, a general plan amendment is a plan required by the regulatory program of the Delta Protection Commission.

SEC. 2. Division 19.5 (commencing with Section 29700) is added to the Public Resources Code, to read:

DIVISION 19.5. DELTA PROTECTION ACT OF l992

CHAPTER 1. FINDINGS AND DECLARATIONS

29700. This division shall be known, and may be cited, as the Johnston-Baker-Andal-Boatwright Delta Protection Act of l992.

29701. The Legislature finds and declares that the Sacramento-San Joaquin Delta is a natural resource of statewide, national, and international significance, containing irreplaceable resources, and it is the policy of the state to recognize, preserve, and protect those resources of the delta for the use and enjoyment of current and future generations.

29702. The Legislature further finds and declares that the basic goals of the state for the delta are the following:

(a) Protect, maintain, and, where possible, enhance and restore the overall quality of the delta environment, including, but not limited to, agriculture, wildlife habitat, and recreational activities.

(b) Assure orderly, balanced conservation and development of delta land resources.

(c) Improve flood protection by structural and nonstructural means to ensure an increased level of public health and safety.

29703. The Legislature further finds and declares as follows:

(a) The delta is an agricultural region of great value to the state and nation and the retention and continued cultivation and production of fertile peatlands and prime soils are of significant value.

(b) The agricultural land of the delta, while adding greatly to the economy of the state, also provides a significant value as open space and habitat for water fowl using the Pacific Flyway, as well as other wildlife, and the continued dedication and retention of that delta land in agricultural production contributes to the preservation and enhancement of open space and habitat values.

(c) Agricultural lands located within the primary zone should be protected from the intrusion of nonagricultural uses.

29704. The Legislature further finds and declares that the leveed islands and tracts of the delta and portions of its uplands are floodprone areas of critical statewide significance due to the public safety risks and the costs of public emergency responses to floods, and that improvement and ongoing maintenance of the levee system is a matter of continuing urgency to protect farmlands, population centers, the state's water quality, and significant natural resource and habitat areas of the delta. The Legislature further finds that improvements and continuing maintenance of the levee system will not resolve all flood risks and that the delta is inherently a floodprone area wherein the most appropriate land uses are agriculture, wildlife habitat, and, where specifically provided, recreational activities, and that most of the existing levee systems are degraded and in need of restoration, improvement, and continuing management.

29705. The Legislature further finds and declares that the delta's wildlife and wildlife habitats, including waterways, vegetated unleveed channel islands, wetlands, and riparian forests and vegetation corridors, are highly valuable, providing critical wintering habitat for waterfowl and other migratory birds using the Pacific Flyway, as well as certain plant species, various rare and endangered wildlife species of birds, mammals, and fish, and numerous amphibians, reptiles, and invertebrates, that these wildlife species and their habitat are valuable, unique, and irreplaceable resources of critical statewide significance, and that it is the policy of the state to preserve and protect these resources and their diversity for the enjoyment of current and future generations.

29706. The Legislature further finds and declares that the resource values of the delta have deteriorated, and that further deterioration threatens the maintenance and sustainability of the delta's ecology, fish and wildlife populations, recreational opportunities, and economic productivity.

29707. The Legislature further finds and declares that there is no process by which state and national interests and values can be protected and enhanced for the delta, and that, to protect the regional, state, and national interests for the long-term agricultural productivity, economic vitality, and ecological health of the delta resources, it is necessary to provide and implement delta land use planning and management by local governments.

29708. The Legislature further finds and declares that the cities, towns, and settlements within the delta are of significant historical, cultural, and economic value and that their continued protection is important to the economic and cultural vitality of the region.

29709. The Legislature further finds and declares as follows:

(a) Regulation of land use and related activities that threaten the integrity of the delta's resources can best be advanced through comprehensive regional land use planning implemented through reliance on local government in its local land use planning procedures and enforcement.

(b) In order to protect regional, state, and national interests in the long-term agricultural productivity, economic vitality, and ecological health of delta resources, it is important that there be a coordination and integration of activities by the various agencies whose land use activities and decisions cumulatively impact the delta.

29710. The Legislature further finds and declares that agricultural, recreational, and other uses of the delta can best be protected by implementing projects that protect wildlife habitat before conflicts arise.

29711. The Legislature further finds and declares that the inland ports of Sacramento and Stockton constitute economic and water dependent resources of statewide significance, fulfill essential functions in the maritime industry, and have long been dedicated to transportation, agricultural, commercial, industrial, manufacturing, and navigation uses consistent with federal, state, and local regulations, and that those uses should be maintained and enhanced.

29712. The Legislature further finds and declares as follows:

(a) The delta's waterways and marinas offer recreational opportunities of statewide and local significance and are a source of economic benefit to the region, and, due to increased demand and usage, there are public safety problems associated with that usage requiring increased coordination by all levels of government.

(b) Recreational boating within the delta is of statewide and local significance and is a source of economic benefit to the region, and to the extent of any conflict or inconsistency between this division and any provisions of the Harbors and Navigation Code, regarding regulating the operation or use of boating in the delta, the provisions of the Harbors and Navigation Code shall prevail.

29713. The Legislature further finds and declares that the voluntary acquisition of wildlife and agricultural conservation easements in the delta promotes and enhances the traditional delta values of agriculture, habitat, and recreation.

29714. The Legislature further finds and declares that, in enacting this division, it is not the intent of the Legislature to authorize any governmental agency acting pursuant to this division to exercise their power in a manner which will take or damage private property for public use, without the payment of just compensation therefor. This section is not intended to increase or decrease the rights of any owner of property under the California Constitution or the United States Constitution.

29715. To the extent of any conflict or inconsistency between this division and any provision of the Water Code, the provisions of the Water Code shall prevail.

29716. Nothing in this division authorizes the commission to exercise any jurisdiction over matters within the jurisdiction of, or to carry out its powers and duties in conflict with the powers and duties of, any other state agency.

CHAPTER 2. DEFINITIONS

29720. Unless the context otherwise requires, the definitions set forth in this chapter govern the construction of this division.

29720.5. "Aggrieved person" has the same meaning as defined in Section 29117.

29721. "Commission" means the Delta Protection Commission created by Section 29735.

29722. "Delta" means the Sacramento-San Joaquin Delta, as defined in Section 12220 of the Water Code, for all provisions of this division, other than Chapter 3 (commencing with Section 29735). For the purposes of Chapter 3 (commencing with Section 29735), "delta" means the area of the delta minus the area contained in Alameda County.

29723. (a) "Development" means on, in, over, or under land or water, the placement or erection of any solid material or structure; discharge of any dredged material or of any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land, including, but not limited to, subdivisions pursuant to the Subdivision Map Act (Division 2 (commencing with Section 66410) of Title 7 of the Government Code), and any other division of land including lot splits, except where the land division is brought about in connection with the purchase of the land by a public agency for public recreational or fish and wildlife uses or preservation; construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes.

(b) "Development" does not include any of the following:

(1) All farming and ranching activities, as specified in subdivision (e) of Section 3482.5 of the Civil Code.

(2) The maintenance, including the reconstruction of damaged parts, of structures, such as marinas, dikes, dams, levees, riprap (consistent with Chapter 1.5 (commencing with Section 12306) of Part 4.8 of Division 6 of the Water Code), breakwater, causeways, bridges, ferries, bridge abutments, docks, berths, and boat sheds. "Maintenance" includes, for this purpose, the rehabilitation and reconstruction of levees to meet applicable standards of the United States Army Corps of Engineers or the Department of Water Resources.

(3) The construction, repair, or maintenance of farm dwellings, buildings, stock ponds, irrigation or drainage ditches, water wells, or siphons, including those structures and uses permitted under the California Land Conservation Act of 1965 (Chapter 7 (commencing with Section 51200) of Part 1 of Division 1 of Title 5 of the Government Code).

(4) The construction or maintenance of farm roads, or temporary roads for moving farm equipment.

(5) The dredging or discharging of dredged materials, including maintenance dredging or removal, as engaged in by any marina, port, or reclamation district, in conjunction with the normal scope of their customary operations, consistent with existing federal, state, and local laws.

(6) The replacement or repair of pilings in marinas, ports, and diversion facilities.

(7) Projects within port districts, including, but not limited to, projects for the movement, grading, and removal of bulk materials for the purpose of activities related to maritime commerce and navigation.

(8) The planning, approval, construction, operation, maintenance, reconstruction, alteration, or removal by a state agency

or local agency of any water supply facilities or mitigation or enhancement activities undertaken in connection therewith.

(9) Construction, reconstruction, demolition, and land divisions within existing zoning entitlements, and development within, or adjacent to, the unincorporated towns of the delta, as permitted in the Delta Area Community Plan of Sacramento County and the general plan of Yolo County, authorized prior to January 1, 1992.

(10) Exploration or extraction of gas and hydrocarbons.

(11) The planning, approval, construction, repair, replacement, alteration, reconstruction, operation, maintenance, or removal of oxidation and water treatment facilities owned by the City of Stockton or the City of Lodi, or facilities owned by any local agency within or adjacent to the unincorporated towns of the delta consistent with the general plan of the County of Sacramento or the County of Yolo, as the case may be.

29724. "Local agency" means any local agency, other than a local government, formed pursuant to general law or special act for the local performance of governmental or proprietary functions within limited boundaries or which maintains facilities within the delta. "Local agency" includes, but is not limited to, a port, water agency, flood control district, county service area, maintenance district or area, improvement district or improvement area, mosquito abatement district, resource conservation district, irrigation district, reclamation district, sanitary or sewer district, or any other zone or area, formed for the purpose of designating an area within which either an assessment or a property tax rate will be levied to pay for a service or improvement benefiting that area or a special function will be carried out within that area.

29725. "Local government" means the Counties of Contra Costa, Sacramento, San Joaquin, Solano, and Yolo, and the Cities of Sacramento, Stockton, Tracy, Antioch, Pittsburg, Isleton, Lathrop, Brentwood, Rio Vista, and West Sacramento.

29726. "Pacific Flyway" means the identified migratory bird flight path, including feeding and nesting habitat, as described in the Central Valley Habitat Joint Venture component of the North American Waterfowl Management Plan (NAWMP-1986).

29727. "Port" means the Port of Sacramento and the Port of Stockton, including all the land owned or leased by those ports.

29728. "Primary zone" means the delta land and water area of primary state concern and statewide significance which is situated within the boundaries of the delta, as described in Section 12220 of the Water Code, but which is not within either the urban limit line or sphere of influence line of any local government's general plan or currently existing studies, as of January 1, 1992. The precise boundary lines of the primary zone includes the land and water areas as shown on the map titled "Delta Protection Zones" on file with the Secretary of State. Where the boundary between the primary zone and secondary zone is a river, stream, channel, or waterway, the boundary line shall be the middle of that river, stream, channel, or waterway.

29729. "Regional plan" means the resource management plan prepared and adopted pursuant to Section 29760.

29730. "Restoration" means actions which return a degraded or deteriorated area to a level of increased productivity, environmental quality, or beneficial values.

29731. "Secondary zone" means all the delta land and water area within the boundaries of the delta not included within the primary zone, subject to the land use authority of local government, and which includes the land and water areas as shown on the map titled "Delta Protection Zones" on file with the Secretary of State.

29732. "Sphere of influence line" refers to those boundaries of local governments as defined in Sections 56425 and 56426 of the Government Code.

29733. "Unincorporated towns" means the communities of Walnut Grove, Clarksburg, Courtland, Hood, Locke, and Ryde.

29734. "Urban limit line" means that general plan line established and approved by any local government within the delta which delineates boundaries beyond which urban development is not publicly proposed by local government, as of January 1, 1992.

CHAPTER 3. ORGANIZATION

29735. There is hereby created the Delta Protection Commission consisting of 19 members as follows:

(a) One member of the board of supervisors of each of the five counties within the delta whose supervisorial district is within the primary zone shall be appointed by the board of supervisors of the county.

(b) Three elected city council members shall be selected and appointed by city selection committees, from regional and area councils of government, one in each of the following areas:

(1) One from the north delta, consisting of the Counties of Yolo and Sacramento.

(2) One from the south delta, consisting of the County of San Joaquin.

(3) One from the west delta, consisting of the Counties of Contra Costa and Solano.

(c) (1) One member each from the board of directors of five different reclamation districts which are located within the primary zone who are residents of the delta, and who are elected by the trustees of reclamations districts within the following areas:

(A) Two members from the area of the North Delta Water Agency as described in Section 9.1 of the North Delta Water Agency Act (Chapter 283 of the Statutes of 1973), provided at least one member is also a member of the Delta Citizens Municipal Advisory Council.

(B) One member from the West Delta consisting of the area of Contra Costa County within the delta.

(C) One member from the area of the Central Delta Water Agency as described in Section 9.1 of the Central Delta Water Agency Act (Chapter 1133 of the Statutes of 1973).

(D) One member from the area of the South Delta Water Agency as described in Section 9.1 of the South Delta Water Agency Act (Chapter 1089 of the Statutes of 1973).

(2) Each reclamation district may nominate one director to be a member. The member from an area shall be selected from among the nominees by a majority vote of the reclamation districts in that area. For purposes of this section, each reclamation district shall have one vote. The north delta area shall conduct separate votes to select each of its two members.

(d) The Director of Parks and Recreation or the director's designee.

(e) The Director of Fish and Game or the director's designee.

(f) The Director of Food and Agriculture or the director's designee.

(g) The executive officer of the State Lands Commission or the executive officer's designee.

(h) The Director of Boating and Waterways or the director's designee.

(i) The Director of Water Resources or the director's designee.

29736. The term of office of the members of the commission shall be for four years. No member may serve in excess of two terms.

29737. Members shall serve without compensation, but the expenses of each member incurred in connection with official duties shall be paid by the commission.

29738. The position of a member of the commission shall be considered vacated upon the loss of any qualification required for appointment, and in that event the appointing authority shall appoint a successor within 30 days of the occurrence of the vacancy. Upon the occurrence of the first vacancy among any of the members listed in subdivision (d), (e), (f), (g), (h), or (i) of Section 29735, the Director of Conservation or the director's designee shall serve as the successor member.

29739. The commission shall elect from its own members a chairperson and vice chairperson whose terms of office shall be two years, and who may be reelected. If a vacancy occurs in either office, the commission shall fill the vacancy for the unexpired term.

29740. One nonvoting member who shall be a Member of the Senate, appointed by the Senate Committee on Rules, and one nonvoting member who shall be a Member of the Assembly, appointed by the Speaker of the Assembly, both of whom represent areas within the primary zone, shall meet with, and participate in the activities of, the commission to the extent that the participation is not incompatible with their respective positions as Members of the Legislature. For the purpose of this division, those Members of the Legislature shall constitute a joint interim investigating committee on the subject of this division, and as such shall have the powers and duties imposed upon those committees by the Joint Rules of the Senate and Assembly.

29741. The time and place of the first meeting of the commission shall be prescribed by the Governor, but in no event shall it be scheduled for a date later than January 31, 1993. All meetings after the first meeting shall be held in a city within the delta.

CHAPTER 4. POWERS AND DUTIES OF THE COMMISSION

29750. The commission shall meet at least monthly. All meetings shall be open to the public as required by law. Notice of the time and place of all regular and special meetings shall be published at least once in a newspaper of general circulation whose area of circulation is throughout the delta. Notice of any meeting shall be published at least seven days prior to the meeting date.

29751. A majority of the voting members of the commission shall constitute a quorum for the transaction of the business of the commission. A majority vote of the voting members present shall be required to take action with respect to any matter unless otherwise specified in this division. The vote of each member shall be individually recorded.

29752. The commission shall adopt its own rules, regulations, and procedures necessary for its organization and operation.

29753. The commission shall appoint agricultural, environmental, and recreational advisory committees for the purpose of providing the commission with timely comments, advice, and information. The commission may appoint committees from its membership or may appoint additional advisory committees from members of other interested public agencies and private groups. The commission shall seek advice and recommendations from advisory committees appointed by local government which are involved in subject matters affecting the delta.

29754. The commission shall establish and maintain an office within the delta, and for this purpose the commission may rent or own property and equipment. Any rule, regulation, procedure, plan, or other record of the commission which is of such a nature as to constitute a public record under state law shall be available for inspection and copying during regular office hours.

29755. The commission shall appoint, and fix the salary of, an executive director who shall have charge of administering the affairs of the commission, including entering into contracts, subject to the directions and policies of the commission. The executive director shall, subject to the approval of the commission, appoint those employees that are necessary to carry out the functions of the commission.

29756. The commission may promote, facilitate, and administer the acquisition of voluntary private and public wildlife and agricultural conservation easements in the delta.

29757. The commission may apply for and accept federal grants or other federal funds and receive gifts, donations, rents, royalties, state funds derived from bond sales, the proceeds of taxes or funds from any other state revenue sources, or any other financial support from public or private sources.

29758. All members of the commission are subject to Title 9 (commencing with Section 85100) of the Government Code.

29759. The commission shall be abolished as of January 1, 1997, and, if provided for by the Legislature, a successor agency shall administer this division on and after that date.

CHAPTER 5. RESOURCE MANAGEMENT PLAN

29760. (a) Not later than July 1, 1994, the commission shall prepare and adopt, by a majority vote of the membership of the commission, and thereafter review and maintain, a comprehensive long-term resource management plan for land uses within the primary zone of the delta. The regional plan shall consist of the map of the primary zone and text or texts setting forth a description of the needs and goals for the delta and a statement of the policies, standards, and elements of the regional plan.

(b) The regional plan shall meet the following requirements:

(1) Protect and preserve the cultural values and economic vitality that reflect the history, natural heritage, and human resources of the delta.

(2) Conserve and protect the quality of renewable resources.

(3) Preserve and protect agricultural viability.

(4) Restore, improve, and manage levee systems by promoting strategies, including, but not limited to, methods and procedures which advance the adoption and implementation of coordinated and uniform standards among governmental agencies for the maintenance, repair, and construction of both public and private levees.

(5) Preserve and protect delta dependent fisheries and their habitat.

(6) Preserve and protect riparian and wetlands habitat, and promote and encourage a net increase in both the acreage and values of those resources on public lands and through voluntary cooperative arrangements with private property owners.

(7) Preserve and protect the water quality of the delta, both for instream purposes and for human use and consumption.

(8) Preserve and protect open-space and outdoor recreational opportunities.

(9) Preserve and protect private property interests from trespassing and vandalism.

(10) Preserve and protect opportunities for controlled public access and use of public lands and waterways consistent with the protection of natural resources and private property interests.

(11) Preserve, protect, and maintain navigation.

(l2) Protect the delta from any development that results in any significant loss of habitat or agricultural land.

(13) Promote strategies for the funding, acquisition, and maintenance of voluntary cooperative arrangements, such as conservation easements, between property owners and conservation groups that protect wildlife habitat and agricultural land, while not impairing the integrity of levees.

(14) Permit water reservoir and habitat development that is compatible with other uses.

(c) The regional plan shall not supersede the authority of local governments over areas within the secondary zone.

(d) In order to facilitate, in part, the requirements of paragraphs (8), (9), (10), and (11) of subdivision (b), the commission shall include in the plan, in consultation with all law enforcement agencies having jurisdiction in the delta, a strategy for the implementation of a coordinated marine patrol system throughout the delta which will improve law enforcement and coordinate the use of resources by all jurisdictions to ensure an adequate level of public safety. The strategic plan shall identify resources to implement that coordination. The commission shall have no authority to abrogate the existing authority of any law enforcement agency.

(e) To the extent that any of the requirements specified in this section are in conflict, nothing in this division shall deny the right of the landowner to continue the agricultural use of the land.

29761. The Director of the Office of Planning and Research shall submit comments and recommendations on the resource management plan for the commission's consideration, prior to the plan's adoption.

29762. The commission shall adopt, by a majority vote of the membership of the commission, the regional plan after at least three public hearings, with at least one hearing held in a city in the north delta, the south delta, and the west delta.

29763. Within 180 days of the adoption of the regional plan or any amendments by the commission, all local governments shall submit to the commission proposed amendments which will cause their general plans to be consistent with the criteria in Section 29763.5 with respect to land located within the primary zone.

29763.5. The commission shall act on proposed general plan amendments within 60 days of submittal. The commission shall approve, by a majority vote of the commission membership, proposed general plan amendments of a local government, as to land located within the primary zone, only after making all of the following written findings, to the extent they are not inconsistent with subdivision (k), based on substantial evidence in the record:

(a) The general plan, and any development approved or proposed that is consistent with the plan, are consistent with the regional plan.

(b) The general plan, and any development approved or proposed that is consistent with the plan, will not result in wetland or riparian loss.

(c) The general plan, and development approved or proposed that is consistent with the plan, will not result in the degradation of water quality.

(d) The general plan, and any development approved or proposed that is consistent with the plan, will not result in increased nonpoint source pollution.

(e) The general plan, and any development approved or proposed that is consistent with the plan, will not result in the degradation or reduction of Pacific Flyway habitat.

(f) The general plan, and any development approved or proposed that is consistent with the plan, will not result in reduced public access, provided the access does not infringe on private property rights.

(g) The general plan, and any development approved or proposed that is consistent with the plan, will not expose the public to increased flood hazard.

(h) The general plan, and any development approved or proposed that is consistent with the plan, will not adversely impact agricultural lands or increase the potential for vandalism, trespass, or the creation of public or private nuisances on public or private land.

(i) The general plan, and any development approved or proposed that is consistent with the plan, will not result in the degradation or impairment of levee integrity.

(j) The general plan, and any development approved or proposed that is consistent with the plan, will not adversely impact navigation.

(k) The general plan, and any development approved or proposed that is consistent with the plan, will not result in any increased requirements or restrictions upon agricultural practices in the primary zone.

29763.8. A local government shall adopt its proposed general plan amendments within 60 days after their approval by the commission.

29764. Nothing in this division shall confer permitting authority upon the commission, nor shall anything in this division require local governments to conform their general plan, or land use entitlement decisions, to that of the regional plan, except as to those areas within the primary zone. The regional plan, as it relates to lands within the secondary zone, shall not preempt local general plans for areas within the secondary zone.

29765. Prior to the commission approving the general plan amendments of the local government, the local government may approve development within the primary zone only after making all of the following written findings on the basis of substantial evidence in the record:

(a) The development will not result in wetland or riparian loss.

(b) The development will not result in the degradation of water quality.

(c) The development will not result in increased nonpoint source pollution or soil erosion, including subsidence or sedimentation.

(d) The development will not result in degradation or reduction of Pacific Flyway habitat.

(e) The development will not result in reduced public access, provided that access does not infringe upon private property rights.

(f) The development will not expose the public to increased flood hazards.

(g) The development will not adversely impact agricultural lands or increase the potential for vandalism, trespass, or the creation of public or private nuisances on private or public land.

(h) The development will not result in the degradation or impairment of levee integrity.

(i) The development will not adversely impact navigation.

(j) The development will not result in any increased requirements or restrictions upon agricultural practices in the primary zone.

29766. Nothing in this division shall deny the right of private or public property owners and local governments to establish agriculture preserves and enter into contracts pursuant to the California Land Conservation Act of 1965 (Chapter 7 (commencing with Section 51200) of Part 1 of Division 1 of Title 5 of the Government Code) or apply other enforceable restrictions or zoning within the primary zone or the secondary zone.

29767. In implementing the regional plan, the exercise of the power of eminent domain is prohibited unless requested by the landowner.

CHAPTER 6. APPEAL AND JUDICIAL REVIEW

29770. (a) Any person aggrieved by any action taken by a local government in implementing the regional plan or otherwise taken pursuant to this division may file an appeal with the commission. The ground for an appeal and the commission consideration of an appeal shall be that an action, as to land located exclusively within the primary zone, is inconsistent with the regional plan, the portions of a general plan that implement the regional plan, or this division. The appeal shall be heard by the commission within 60 days of the filing of the appeal, unless the commission, either itself or by delegation to the executive director, determines that the issue raised on appeal is not within the commission's jurisdiction or does not raise an appealable issue.

(b) The commission shall, by regulation, adopt administrative procedures governing these appeals.

29771. After a hearing on the appeal, held in accordance with regulations adopted pursuant to Section 29770, the commission shall either deny the appeal or remand the matter to the local government, after making specific findings, for reconsideration. Upon remand, the local agency may modify the permit or approval and resubmit the matter for review to the commission. The permit or approval shall not be effective until the commission adopts written findings based on substantial evidence in the record that the permit or approval is consistent with the regional plan and the approved local general plan.

29772. An aggrieved person may seek judicial review of any action taken by the commission in adopting the regional plan or by a local government that is appealable pursuant to subdivision (a) of Section 29770, by filing a petition for writ of mandate in accordance with Section 1094.5 of the Code of Civil Procedure within 60 days after the date that the action was taken or, if appealed to the commission, within 60 days after the final decision of the commission.

CHAPTER 7. FINANCIAL PROVISIONS

29775. A penalty assessment in the amount of 10 percent shall be assessed on any fine imposed pursuant to Section 12002, 12002.1, or 12002.2 of the Fish and Game Code for a violation that occurs within the delta. A penalty assessment in the amount of 10 percent shall also be assessed on any fine imposed pursuant to Section 668 of the Harbors and Navigation Code for any violation occurring within the delta.

29776. Any penalty assessed pursuant to Section 29775 shall be transmitted to the Treasurer for deposit in the Sacramento-San Joaquin Delta Protection Fund, which is hereby created in the State Treasury. The money in the Sacramento-San Joaquin Delta Protection Fund is available, upon appropriation by the Legislature, for support of the commission, commencing in the 1992-93 fiscal year, in an amount not to exceed two hundred fifty thousand dollars ($250,000) in any fiscal year.

29777. (a) The commission shall submit to the Governor and the Legislature, on or before December 31, 1993, a report setting forth its recommendation for legislation that would provide funding sources to replace the penalty assessment prescribed by Section 29775 that would provide sufficient funds, in an amount not to exceed two hundred fifty thousand dollars ($250,000) in any fiscal year, for its activities and operations pursuant to this division.

(b) In preparing the report, the commission shall meet and consult with individuals and groups whose activities the commission is considering as potential funding sources.

(c) The commission shall not incur costs in excess of the amount of funds available for expenditure by the commission in any fiscal year.

CHAPTER 8. ANNUAL REPORT

29780. Commencing on January 1, 1995, and every year thereafter, the commission shall submit to the Governor and the Legislature a report describing the progress in achieving the objectives of this division. The report shall include, but not be limited to, all of the following:

(a) An evaluation of the effectiveness of the regional plan in preserving agricultural lands, restoring delta habitat, improving levee protection and water quality, providing increased public access and recreational opportunities, and in undertaking other functions prescribed in this division.

(b) An update of the regional plan, using baseline conditions set forth in the original regional plan.

(c) The status of the environmental thresholds established by the commission in the original regional plan.

SEC. 3. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act. Notwithstanding Section 17580 of the Government Code, unless otherwise specified in this act, the provisions of this act shall become operative on the same date that the act takes effect pursuant to the California Constitution.

SEC. 4. The sum of two hundred fifty thousand dollars ($250,000) is hereby appropriated from the California Environmental License Plate Fund to the Delta Protection Commission as a loan for costs incurred for organization and operation of the commission, including costs incurred for preparation and adoption of the regional plan, as defined in Section 29729 of the Public Resources Code. The loan shall be repaid to the California Environmental License Plate Fund not later than December 31,1998.

Selected References

The Department of Water Resources has published many documents relating to the Delta over the years. The following reports are the most pertinent ones released between 1978 and 1992:

Delta Water Facilities, Program for: Delta Protection and Water Transfer, Water Conservation, Water Recycling, and Surface and Ground Water Storage. Bulletin 76. July 1978.

Delta Levees Investigation. Bulletin 192-82. December 1982.

Delta Alternatives Material (four volumes). December 1982. Reference copies only. Volumes III and IV contain material on Senate Bill 200 and Assembly Concurrent Resolution 90 (Proposition 8). Division of Planning.

Alternatives for Delta Water Transfer. November 1983.

Sacramento-San Joaquin Delta Water Quality Surveillance Program, Monitoring Results Pursuant to Delta Water Rights Decision 1485. Text and three volumes of data. August 1985. Central District.

Final Environmental Impact Report on Proposed Additional Pumping Units, H. O. Banks Delta Pumping Plant, Summary. January 1986. Central District.

Interagency Delta Health Aspects Monitoring Program, Project Report. December 1986. Central District.

Sacramento-San Joaquin Delta Emergency Water Plan. Report to Legislature. December 1986. Central District.

Flood Protection of State Highways in the Sacramento-San Joaquin Delta. December 1987. Central District.

Sacramento-San Joaquin Delta Flood Hazard Mitigation Plan. January 1989. Central District.

The Delta as a Source of Drinking Water, Summary of Monitoring Results: 1983-1987. January 1989. Central District.

Water Quality Conditions in the Sacramento-San Joaquin Delta During 1987. Report to the State Water Resources Control Board in Accordance with Water Rights Decision 1485, Order 4(f). May 1989. Central District.

The Delta as a Source of Drinking Water, Monitoring Results: 1983-1987. August 1989. Central District.

Delta Subsidence Investigation. October 1989. Central District.

Proposed Sherman Island Wildlife Management Plan -- Initial Study and Negative Declaration. January 1990. Division of Planning.

Delta Levee Slope Protection Alternatives. February 1990. Division of Design and Construction.

Actions and Priorities, Delta Flood Protection Act, Eight Western Delta Islands. March 1990. Division of Planning.

Negative Declaration: Proposed South Delta Water Management Program -- Land Purchase. April 1990. Division of Planning.

Water Quality Conditions in the Sacramento-San Joaquin Delta During 1987. (Text and three volumes of data.) Text, May 1990; Volume 1, *Water Quality*, May 1990; Volume 2, *Phytoplankton,* May 1990; Volume 3, *Benthos,* May 1990. Central District.

Delta Island Drainage Investigation, Report of the Interagency Delta Health Aspects Monitoring Program. June 1990. Division of Local Assistance.

Draft Environmental Impact Report/Environmental Impact Statement: South Delta Water Management Program (Phase I of Water Banking Program). June 1990. Division of Planning.

Management of the State Water Project. Appendix E, *1987 Water Operations in the Sacramento-San Joaquin Delta.* Bulletin 132-88. October 1990.

Interagency Delta Health Aspects Monitoring Program, Summary of Monitoring Results, January 1988--December 1989. October 1990. Division of Local Assistance.

Draft Environmental Impact Report/Environmental Impact Statement: North Delta Program. November 1990. Division of Planning.

Water Quality Conditions in the Sacramento-San Joaquin Delta During 1989. Report to the State Water Quality Control Board in Accordance with Water Rights Decision 1485, Order 4(f). July 1991. Central District.

Use of Global Positioning System to Establish a Common Vertical Datum in the Sacramento-San Joaquin Delta, California. August 1991. Division of Land and Right of Way.

Early Stages and Early Life History of the Delta Smelt in the Sacramento-San Joaquin Estuary, with Comparison of Early Life Stages of the Long Fin Smelt. August 1991. Central District.

Long-term Trends in Zooplankton Distribution and Abundance in the Sacramento-San Joaquin Estuary. May 1992. Environmental Services Office.

Water Quality Conditions in the Sacramento-San Joaquin Delta in 1990. June 1992. Environmental Services Office.

Biological Assessment -- Effects of Central Valley Project and State Water Project Operations on Winter-run Chinook Salmon. October 1992. Environmental Services Office.

Evaluation of Selected Biological Factors That May Have Contributed to the Drought and Post-drought Decline in Chlorophyll, a Concentration. April 1990 (released in December 1992). Environmental Services Office.

Time Line of Delta Events

1772 First recorded sighting of Delta by Fray Juan Crespi and Captain Pedro Farges.

1776 San Carlos—first ship to enter San Francisco Bay.

1849 Settlers begin arriving in the Delta to farm its rich soils while Forty-Niners pass through on their way to strike gold in the Sierra foothills.

1850 Congress passes the Federal Swamp and Overflow Act, which provided for the title of wetlands to be transferred from the Federal Government to the states.

1861 California Legislature authorizes the Reclamation District Act, allowing drainage of Delta lands and construction of sturdier levees.

1869 Sherman Island is the site of the first coordinated levee system in the Delta.

1879 Prized by fisherman, the Striped Bass is brought by rail from the East Coast to the Delta. Two more shipments are required before the fish is established.

1880 Most of the Delta reclaimed using dredges developed to build levees quickly and inexpensively. By 1930, all but minor areas of swampland had been leveed and were being farmed.

1884 Federal Circuit Court decision in Woodruff v. North Bloomfield, et al., requires termination of mining debris discharges into California rivers. Hydraulic mining had deposited tons of silt and sand in Delta channels and upstream rivers.

1900 California's population is estimated at 1.5 million.

1902 Congress passes the Reclamation Act for development of irrigated lands in the western United States.

1911 The Reclamation Board is created by the California Legislature to implement a comprehensive flood control plan for the Sacramento and San Joaquin rivers.

1914 California Legislature passes bill to revise water right law regarding appropriation of surface water.

1930 State completes comprehensive investigation of Delta salinity and its control, and also the State Water Plan (now the Central Valley Project) to transfer northern California water throughout the Central Valley.

1933 Corps of Engineers dredges Stockton Deep Water Ship Channel to Port of Stockton.

Congress authorizes the Central Valley Project (CVP).

1940 Export of Delta water begins with U.S. Bureau of Reclamation (USBR) completion of the Contra Costa Canal, the first unit of the CVP.

1944 Shasta Dam and Reservoir completed as a key feature of the CVP; adds water to Delta channels during low-flow periods, thereby limiting salinity intrusion.

1951 Delta export increases with completion of the Delta-Mendota Canal, another unit of the CVP.

USBR constructs the Delta Cross Channel to aid in transferring water from the Sacramento River across the Delta to the Tracy Pumping Plant, which serves the Delta Mendota Canal.

1959 State Legislature passes the Delta Protection Act and the Burns-Porter Act to assist in financing the State Water Project, including Delta facilities. The SWP, which would increase Delta exports, was approved by California voters in 1960.

1960 California voters approve the Burns-Porter Act (also called the State Water Project Development Bond Act) authorizing the sale of $1.75 billion of general obligation bonds to help finance the SWP. California's population is 15.7 million.

1963 Corps of Engineers dredges the Sacramento Deep Water Channel to the port of Sacramento.

1965 Interagency Delta Committee, formed in 1961, completed its report recommending various Delta facilities, including the Peripheral Canal, to offset adverse effects of increasing Delta exports.

1967 Oroville Dam and Reservoir is completed as a key feature of the SWP and the Feather River Fish Hatchery is opened to replace spawning areas lost as a result of the dam.

The first stage of the Harvey O. Banks Delta Pumping Plant is completed along with the John E. Skinner Fish Facility.

1971 State Water Resources Control Board (SWRCB) adopts its Delta Water Rights Decision 1379 establishing Delta water quality standards to be met by the Central Valley Project (CVP) and SWP.

1973 California Aqueduct completed to Southern California.

Legislature passes Senate Bill 541 (also known as the Way Bill) to provide State financial assistance for maintenance and improvement of certain Delta levees.

Delta Environmental Advisory Committee (DEAC) concludes that a federal-State Peripheral Canal, properly designed and operated, is necessary to protect the Delta.

1978 SWRCB issues Water Right Decision 1485 updating Delta water quality standards and establishing water quality standards for Suisun Marsh.

1980 State Legislature passes Senate Bill 200 specifying the Peripheral Canal as the Delta water transfer facility, requiring staged construction and fish screen testing but without requiring federal participation.

1982 California voters defeat Proposition 9, which includes the Peripheral Canal, the SB 200 package of statewide facilities, and Delta protection, by a 3-2 margin.

1986 Congress passes DWR and USBR historic accord, the CVP-SWP Coordinated Operation Agreement.

California Supreme Court affirms State court of Appeal ruling (Racanelli Decision) strengthening SWRCB powers to protect the Bay/Delta system. The Racanelli Decision covered eight cases challenging SWRCB's Decision 1485, issued in 1978, and its Water Quality Control Plan for the Delta and Suisun Marsh. The decision recognizes SWRCB's broad authority and discretion over water rights and water quality issues, including jurisdiction over the federal CVP.

DWR and the Department of Fish and Game sign the Delta Pumping Plant fishery mitigation agreement for direct fish loss.

1987 DWR installs Middle River Weir as part of an agreement with the South Delta Water Agency to improve water conditions for local agricultural diverters. It is the first component of a temporary program designed to provide data for a more permanent solution.

1988 DWR completes pumping plant for North Bay Aqueduct and the Suisun Marsh salinity control gates.

1988 Legislature passes Senate Bill 34, which provides $120 million over a 10-year period for DWR to rebuild Delta levees, enlarge channels, and help reclamation districts make levee improvements.

An engineering study by the California Urban Water Agencies examines options for improving drinking water quality for users of Delta water.

1990 California's population is now 29.8 million. (1990, U.S. Census)

1991 Construction completed on four additional pumping units at the Banks Pumping Plant.

1992 The Legislature passes the Delta Protection Act of 1992 establishing the Delta Protection Commission. The Commission is to develop a comprehensive, long-term resources management plan for the Delta by July 1, 1994.

Congress passes the Central Valley Project Improvement Act (PL 102-575) which allows water transfers from CVP contractors to other water users, reforms water pricing, and commits up to 800,000 acre-feet annually to fish and wildlife purposes.

Governor establishes Bay-Delta Oversight Committee for long-term Delta planning.

1993 The Delta Smelt is listed as a Threatened Species and actions are defined (such as pulse flows on the Sacramento River and limitations on certain flows within the Delta) to improve conditions for the smelt and the Winter-run Salmon (an Endangered Species).

Species of Concern

Fish, Wildlife, and Plant Species of Concern in the Sacramento-San Joaquin Delta
(Federal listing effective January 31, 1992; State listing effective April 9, 1992)

Fish:

Winter-run Chinook Salmon, *Oncorhynchus tshawytscha* (SE,FT)

Sacramento Splittail, *Pogonichthys macrolepidotus* (FC)

Delta Smelt, *Hypomesus transpacificus (FT, 4/93)*

Green Sturgeon, *Acipenser medirostris*

Sacramento Perch (native population), *Archoplites interruptus*

Sacramento Blackfish, *Orthodon microlepidotus*

Hardhead, *Mylopharodon conocephalus*

Longfin Smelt, *Spirinchus thaleichthys*

Birds:

Bald Eagle, *Haliaeetus leucocephalus* (SE, FE)

Tricolored Blackbird, *Agelaius tricolor*

American Peregrine Falcon, *Falco peregrinus anatum* (SE, FC)

Califonia Clapper Rail, *Rallus longirostris obsoletus* (SE, FE)

Swainson's Hawk, *Bueteo swinsoni* (ST, FC)

Greater Sandhill Crane, *Grus canadensis tabida* (ST)

California Black Rail, *Laterallus jamaicensis coturniculus* (ST, FC)

California Least Tern, *Sterna albifrons browni* (SE, FE)

Calif. Yellow-Billed Cuckoo, *Coccyzus americanus Occidentalis* (ST, FC)

California Brown Pelican, *Pelecanus occidentalis californicus* (SE, FE)

Mammals:

San Joaquin Kit Fox, *Vulpes macrotis mutica* (ST, FE)

Salt Marsh Harvest Mouse, *Reithrodontomys raviventris* (SE, FC)

Riparian Brush Rabbit, *Sylvilagus bachmani riparius*

San Joaquin Valley Woodrat, *Neotoma fuscipes riparia*

San Pablo California Vole, *Microtus californicus sanpabloensis*

Pacific Western Big-eared Bat, *Plecotus townsendii townsendii*

Salt Marsh Vagrant Shrew, *Sorex vagrans halicoetes*

Suisun Ornate Shrew, *Sorex ornatus sinuosus*

San Francisco Dusky-footed Woodrat, *Neotoma fuscipes annectens*

Reptiles:

Giant Garter Snake, *Thamnophis Gigas*

Northwestern Pond Turtle, *Clemmmys marmorata marmorata*

Alameda Whip Snake, *Masticophis lateralis euryxanthus* (ST)

Amphibians:

California Red-legged Frog, *Rana aurora draytonii*

Califonia Tiger Salamander, *Ambystoma tigrinum californiense*

Western Spadefoot Toad, *Scaphiopus hammondi hammondi*

SE = State Endangered ST = State Threatened SR = State Rare FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate

Plants:

Palmate-bracted Bird's-beak, *Cordylanthus palmatus*

Butte County Meadowfoam, *Limnanthes floccosa ssp. californica*

Sacramento Valley Milk-vetch, *Astragalus tener var. ferrisae*

California Hibiscus, *Hibiscus californicus*

Ahart's Rush, *Juncus leiospermus var. ahartii*

Veiny Monardella, *Monardella douglasii var. venosa*

Ahart's Whitlow-wort, *Paronychia ahartii*

Hartweg's Golden Sunburst, *Pseudobahia bahiifolia*

Large-flowered Fiddleneck, *Amsinckia grandiflora*

Contra Costa Wallflower, *Erysimum capitatum var. angustatum* (SE, FE)

Antioch Dunes Evening-primrose, *Oenothera deltoides ssp. howellii* (SE, FE)

Solano Grass, *Tuctoria mucronata*

Suisun Aster, *Aster chilensis var. lentus*

Heartscale, *Atriplex cordulata*

Valley Spearscale, *Atriplex joaquiniana*

Slough Thistle, *Cirsium crassicaule*

Hispid Bird's-beak, *Cordylanthus mollis ssp. hispidus*

Soft Bird's-beak, *Cordylanthus mollis ssp. mollis* (SR, FC)

Recurved Larkspur, *Delphinium recurvatum*

Contra Costa Buckwheat, *Eriogonum tuncatum*

Delta Coyote-thistle, *Eryngium racemosum* (SE, FC)

Diamond-petaled Poppy, *Eschscholzia rhombipetala*

Fragrant Fritillary, *Fritillaria liliacea*

Adobe Lily, *Fritillaria pluriflora*

Boggs Lake Hedge-hyssop, *Gratiola heterosepala* (SE, FC)

Diablo Rock-rose, *Helianthella castanada*

Brewer's Dwarf-flax, *Hesperolinon breweri*

California Hibiscus, *Hibiscus californicus*

Hinds' Walnut, *Juglans hindsii*

Contra Costa Goldfields, *Lasthenia conjugens*

Delta Tule-pea, *Lathyrus jepsonii ssp. jepsonii*

Legenere, *Legenere limosa*

Mason's Lilaeopsis, *Lilaeopsis masonii* (SR, FC)

Colusa Grass, *Neostapfia colusana* (SE, FC)

Slender Orcutt Grass, *Orcuttida tenuis* (SE, FC)

Gairdner's Yampah, *Perideridia gairdneri ssp. gairdneri*

Bearded Allocarya, *Plagiobothrys hystriculus*

Valley Sagittaria, *Sagittaria sanfordii*

Showy Indian Clover, *Trifolium amoenum*

Caper-fruited Tropidocarpum, *Tropidocarpum capparideum*

Beach Layia, *Layia carnosa*

Sonoma Alopecurus, *Alopecuras aequalis var. sonomensis*

Swamp Sandwort, *Arenaria paludicola*

Northcoast Bird's-beak, *Cordylanthus maritimus ssp. palustris*

Hoover's Button-celery, *Eryngium aristulatum var. hooveri*

San Francisco Gumplant, *Gindelia maritima*

Wedge-leaved Horkelia, *Horkelia cuneata ssp. jepsonii*

Hairless Allocarya, *plagiobothrys glaber*

Marin Knotweed, *Polygonum marinense*

Sacramento Orcutt Grass, *Orcuttia viscida* (SE, FC)

Crampton's Tuctoria, *Tuctoria mucronata* (SE, FE)

Shippee Meadowfoam, *Limnanthes floccosa spp california* (SE, FC)

Green's Tuctoria, *Tuctoria greenei* (SR, FC)

Dudley's Lousewort, *Pedicularis dudleyi* (SR)

Invertebrates:

Valley Elderberry Longhorn Beetle, *Desmocerus californicus Dimorphus*

Sacramento Valley Tiger Beetle, *Cicindela hirticollis abrupta*

Delta June Beetle, *Polyphylla stellata*

Antioch Dunes Anthicid Beetle, *Anthicus antiochensis*

Sacramento Anthicid Beetle, *Anthicus sacramento*

Lange's Metalmark butterfly, *Apodemia mormo langei*

Vernal Pool Fairy Shrimp, *Branchinecta lynchi*

California Linderiella, *Linderiella occidentalis*

Conservancy Fairy shrimp, *Branchinecta longiantenna*

Longhorn Fairy Shrimp, *Branchinecta longiantenna*

Vernal Pool Tadpole Shrimp, *Lepidurus packardi*

SE = State Endangered ST = State Threatened SR = State Rare FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate

Middlekauf's Shieldback Katydid, *Idiostatus middlekaufi*

Ciervo Aegialian Scarab Beetle, *Coelus gracilis*

San Joaquin Dune Beetle, *Coelus gracilis*

Curved-foot Hygrotus Diving Beetle, *Hygrotus curvipes*

Antioch Cophuran Robberfly, *Cophura hurdi*

Hurd's Metapogan Robberfly, *Metapogan hurdi*

Antioch Mutillid Wasp, *Mymosula pacifica*

Yellow-banded Andrenid Bee, *Perdita hirticeps luteocincta*

Antioch Andrenid Bee, *Perdita Scitula antiochensis*

Antioch Sphecid Wasp, *Philanthus nasalis*

SE = State Endangered ST = State Threatened SR = State Rare FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate

Non-Native Species

Introduced Species in the Sacramento - San Joaquin Delta

Plants

Common Name	Scientific Name
Barnyard grass	*Echinochloa crusgalli*
Asparagus	*Asparagus officinalis*
Water hyacinth	*Eichhornia crassipes*
Oats	*Avena* spp.
Ripgut grass	*Bromus diandrus*
Pampas grass	*Cortaderia selloana, C. jubata*
Bermuda grass	*Cynodon dactylon*
Fescue	*Festuca* spp.
Foxtail	*Hordeum stebbinsi*
Barley	*Hordeum vulgare*
Italian wildrye	*Lolium multiflorum*
Knot grass	*Paspalum dilatatum*
Canary grass	*Phalaris canariensis*
Rabbitfoot grass	*Polypogon monspeliensis*
Johnson grass	*Sorghum halpense*
Milo	*Sorghum vulgare*
Corn	*Zea mays*
Pond weed	*Potamogeton* sp.
Silver maple	*Acer saccharinum*
California pepper	*Schinus molle*
Poison hemlock	*Conium maculatum*
Fennel	*Poeniculum vulgare*
Oleander	*Nerium oleander*
Periwinkle	*Vinca major*
Horseweed	*Conyza canadensis*
Common brass buttons	*Cotula coronopifolia*
Cardoon	*Cynara cardunculus*
Horseweed	*Erigeron canadensis*
Prickly lettuce	*Lactuca serriola*
Bristly oxtonque	*Picris echiodes*
Milk thistle	*Silybum marianum*
Sow thistle	*Sonchus* spp.
Cocklebur	*Xanthium strumarium var. canadense*
Mustard	*Brassica geniculata*
Common yellow mustard	*Brassica campestris*
Perennial peppergrass	*Lepidium latifolium*
Wild radish	*Raphanus sativus*
Australian saltbush	*Atriplex semibaccata*
Mexican tea	*Chenopodium ambrosioides*
Russian thistle	*Salsola kali*

Field bindweed	*Convolvulus arvensis*
Hedge bindweed	*Convolvulus sepium*
Wild radish	*Raphamus sativus*
Acacia	*Acacia* sp.
Lotus	*Lotus uliginosus*
White sweet clover	*Melilotus albus*
Yellow sweet clover	*Melilotus indicus*
Black locust	*Robinia pseudoacacia*
Spanish broom	*Spartium junceum*
Broad leaf filaree	*Erodium botrys*
Parrot's feather	*Myriophyllum brasiliense*
English walnut	*Juglans regia*
Henbit	*Lamium* spp.
Horehound	*Marrubium vulgare*
Velvet leaf	*Arbutilon theophrasti*
Hemp	*Cannabis sativa*
Bottlebrush	*Callistemon* spp.
Eucalyptus	*Eucalyptus* spp.
Buckhorn plantain	*Plantago lanceolata*
Common knotweed	*Polygonum aviculare*
Water smartweed	*Polygonum amphibium*
Curly dock	*Rumex crispus*
Almond	*Prunus amygdalus*
Himalaya-berry	*Rubus procerus*
Weeping willow	*Salix babylonica*
Common mullein	*Verbascum thapsus*
Jimson weed	*Datura stramonium*
Chinese elm	*Ulmus parviflora*
Mat grass	*Lippia nodiflora*
Puncture vine	*Tribulus terrestris*

Invertebrates

Common Name	Scientific Name
Hydra	*Cladonama uchidi*
Amphipod	*Corophium alienense*
	Caprella mutica
Isopod	*Dynoides dentisinus*
	Ianiropsis serricaudis
	Cirolana arcuata
Cumace	*Hemileucon hinumensis*
Copepod	*Oithona davisae*
	Sinocalanus doerrii
	Limnocalanus sinensis
	Pseudodiaptomus marinus and *P. forebesi*
Bivalve	*Potamocorbula amurensis*
	Theora fragilis

Other Clams

Asiatic clam	*Corbicula fluminea*
Japanese cockle	*Tapes Japonica*
Gem clam	*Gemma gemma*
Grass shrimp	*Palaemon macrodactylus*
Crayfish	*Pacifastacus leniucculus*
Crayfish	*Procambarus clarkii*
Mud crab	*Rhithropanopeus harrisi*

Amphibian

Common Name	Scientific Name
Bullfrog	*Rana catesbeiana*

Fish

Common Name	Scientific Name
Threadfin shad	*Dorosoma petenense*
American shad	*Alosa sapidissima*
Brown trout (sea-run)	*Salmo trutta*
Golden shiner	*Notemigonus crysoleucas*
Fathead minnow	*Pimephales promelas*
Goldfish	*Carassius auratus*
Carp	*Cyprinus carpio*
Black bullhead	*Ictalurus melas*
Brown bullhead	*Ictalurus nebulosus*
Yellow bullhead	*Ictalurus natalis*
White catfish	*Ictalurus catus*
Channel catfish	*Ictalurus punctatus*
Blue catfish	*Ictalurus furcatus*
Rainwater killifish	*Lucania parva*
Mosquito fish	*Gambusia affinis*
Inland silverside	*Menidia audena*
Threespine stickleback	*Gasterosteus aculaetus*
Striped bass	*Morone saxatilis*
Bluegill	*Lepomis macrochirus*
Green sunfish	*Lepomis cyanellus*
Redear sunfish	*Lepomis microlophus*
Warmouth	*Lepomis gulosus*
White crappie	*Pomoxis annularis*
Black crappie	*Pomoxis nigromaculatus*
Largemouth bass	*Micropterus salmoides*
Small mouth bass	*Micropterus dolomieui*
Bigscale logperch	*Percina macrolepida*

Yellow perch	*Perca flavescens*
Yellowfin goby	*Acanthogobius flavimanus*
Chameleon goby	*Tridentiger trigonocephalus*

Birds

Common Name	Scientific Name
Ring-necked pheasant	*Phasianus colchicus*
Rock dove	*Columba livia*
European starling	*Sturnus vulgaris*

Mammals

Common Name	Scientific Name
Virginia opossum	*Didelphis virginiana*
Muskrat	*Ondatra zibethicus*
Black rat (roof rat)	*Rattus rattus*
Norway rat	*Rattus norvegicus*
House mouse	*Mus musculus*
Feral cats and dogs	*Felis domesticus, Canis domesticus*

Legislators

Following is a list of legislators and their Districts in the Delta.
Actual District boundaries are shown on pages 72, 74, and 75.

State Senate Districts

4	Maurice Johannessen	(916) 445-3353
5	Patrick Johnston	(916) 445-2407
6	Leroy F. Greene	(916) 445-7807
7	Daniel E. Boatwright	(916) 445-6083
12	Dick Monteith	(916) 445-1392

State Assembly Districts

8	Thomas Hannigan	(916) 445-8368
9	Phillip Isenberg	(916) 445-1611
10	Larry Bowler	(916) 445-7402
11	Robert Campbell	(916) 445-7890
15	Richard K. Rainey	(916) 445-6161
17	Michael Machado	(916) 445-7931
26	Sal Cannella	(916) 445-8570

Congressional Districts

3	Vic Fazio	(916) 978-4381
5	Robert T. Matsui	(916) 551-2846
7	George Miller	(510) 602-1880
10	Bill Baker	(510) 932-8899
11	Richard W. Pombo	(209) 835-4247
18	Gary Condit	(209) 527-1914

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Delta Atlas On-Line

A version of the Sacramento-San Joaquin Delta Atlas is available on the World Wide Web.

The address for the on-line Delta Atlas is **http://locke.water.ca.gov**, which is the Division of Planning's home page. From there you may access the Delta Atlas or several other DWR Planning reports, such as Bulletin 160-93, *The California Water Plan Update.*

You may also be interested in other DWR or California Resources World Wide Web sites. Below is a partial list of water and other natural resources related sites.

- ❑ Department of Water Resources Home Page:
  http:// wwwdwr.water.ca.gov

- ❑ California Cooperative Snow Surveys Home Page:
  http:// snow.water.ca.gov

- ❑ California Environmental Resources Evaluation System (CERES) Home Page:
  http://resources.agency.ca.gov

- ❑ California Home Page:
  http://www.ca.gov/gov/calhome.html

- ❑ California's Natural Resources Home Page:
  http://resources.agency.ca.gov/ceres/calweb/Natural_Resources.html