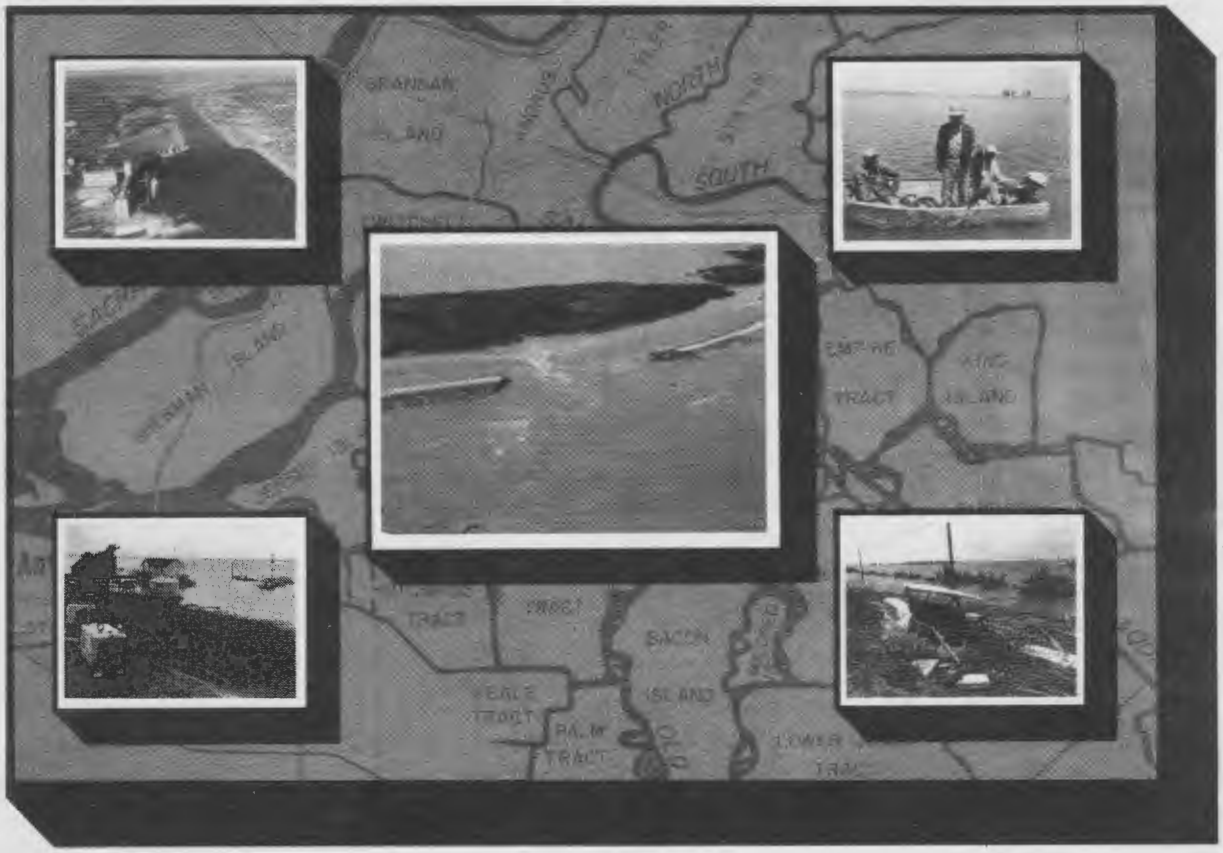
Sacramento / San Joaquin
Delta Dilemma



Prepared by
Assembly Office of Research
January 1982

Assembly
California Legislature

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COMMITTEE ON POLICY RESEARCH MANAGEMENT
January 13, 1982

To the Speaker and Members of the Assembly

Dear Mr. Speaker and Members:

The winter of 1982 presents a severe test to the Sacramento/San Joaquin Delta levees. High water levels in Northern California and Central Valley rivers, combined with periods of high tides and strong winds, place the entire Delta in jeopardy. Several of the threatened tracts and islands flooded in 1980, costing the state millions of dollars to reclaim. Many of the levees which guard the lands from encroaching waters are over 100 years old and need repair.

The enclosed report, Delta Dilemma, prepared by Assembly Office of Research staff under the direction of Dr. James W. Rote, documents the value of the Delta, and presents the many problems and issues that must be resolved. The report focuses on the questions, "Who benefits from Delta protection?" and "Who should pay for a levee restoration program?"

Delta levee problems have been studied for years. The U.S. Army Corps of Engineers and California Department of Water Resources are presently conducting a joint study. But levee restoration plans have never been implemented, funds have never been secured and a cost sharing formula has never been established. With the rising cost of a major levee restoration program approaching one billion dollars, now is the time for resolving these issues.

The report recommends the immediate formation of an Emergency Delta Task Force to advise the State Assembly on a course of action. This body, representing the various Delta interests, would be charged with (1) designing a method for raising revenues at the local level; (2) developing a cost sharing formula for the allocation of levee restoration funds; and (3) proposing a preferred restoration plan to the Legislature after a detailed review of the Army Corps of Engineers and Department of Water Resources reports.

The enormous resource values associated with the Delta and the statewide interests in these resources dictate that the area be preserved. Solutions to the "Delta Dilemma" must be enacted soon, before there is no Delta to protect.

Respectfully submitted,

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Director

SACRAMENTO/SAN JOAQUIN

DELTA DILEMMA

Prepared by
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January, 1982
State Capitol
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(Cover and project pictures courtesy of the Department of Water Resources)

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SUMMARY

Following a series of meetings in early 1981 with Department of Water Resources (DWR) personnel, Rand Corporation researchers, and other persons knowledgeable in California water issues, the Assembly Office of Research (AOR) decided to focus water policy research efforts on the Sacramento - San Joaquin Delta (Delta). A University of California/DWR sponsored conference, The Future of the Delta, held on March 16-17, 1981 in Sacramento, highlighted the need for a comprehensive examination of the beneficial uses and alternative resource management policies for the area.

The primary focus of the AOR study was land ownership in the Delta and the importance of the levee system protecting the islands and tracts from the surrounding waterways. Although the study concentrated primarily on rehabilitation of the levees, other issues (such as water exports, the proposed Peripheral Canal, and other development projects) as might influence the integrity of the levees and the salinity regime in the Delta, were examined.

The entire array of beneficial uses (agriculture, fisheries, wildlife habitat, recreation, water quality, water exports, shipping, natural gas and oil fields, utility corridors, and historical and cultural resources) were examined. The many problems and issues facing the Delta (flood control, levee maintenance, earthquake hazards, subsidence control, destruction of levee vegetation, protection of fish and wildlife habitat, shortage of public access and recreation facilities, lack of adequate land use controls, and inadequate funds for levee improvement and maintenance) were also investigated.

Multiple Resource Values

Nearly everyone says they want to preserve the Delta. The following interest groups benefit to some extent from the vitality of the area:

Farmers and businessmen; resort owners; residents and visitors; consumers of natural gas from the Delta; users of water, municipal utilities, railroads and highways; boaters, waterskiers, swimmers, picnickers and campers; fishermen; hunters; water users in the San Francisco Bay Area, San Joaquin Valley and Southern California; naturalists; consumers of Delta farm products; and local, state and federal taxpayers.

Continued levee failure and island flooding would have a severe economic impact on a multitude of Delta resources. Estimates of the annual value of some of these resources are as follows:

		millions of dollars	
Agriculture	-	$ 400	(gross)
Natural Gas	-	183	
Water Exports	-	76	
Recreation	-	75	
Fisheries	-	50	
Industry	-	28	(payroll of two paper mills)
Shipping	-	22	
Oil	-	0.5	
Land (plus improvement)	-	1,600	(acquisition cost)

(See Appendix A for detailed comments on resource values)

Problems

The Delta consists of approximately 60 islands and tracts which are separated by some 700 miles of interconnecting waterways. This reclaimed land, which is intensively farmed, is protected from the surrounding waterways by 1,100 miles of man-made levees. Much of the Delta is composed of organic peat soils, which is ideal for agricultural purposes but serves as a poor foundation material for levees. The organic soil is constantly decomposing and compacting. Over the years, the resulting subsidence has lowered some islands to 25 feet below sea level.

Flooding of Delta lowlands has always been a problem. More than twenty-five islands have flooded in the past fifty years, many of them several times. Historically, flood waters from the Central Valley rivers and high tides from San Francisco Bay were the causes of levee overtopping. Today, flooding of the islands is mainly due to the increased hydrostatic pressure on the levees.

In 1980 greater flood damage occurred in the Delta than ever before. Of the six areas that flooded, five had locally maintained levees. State and federal aid of over $30 million was spent to repair the damaged levees, pump out the water and repair the flood damage. The pumping costs alone on one island (which was foreign-owned) were more than three times the appraised value of the land.

The U.S. Army Corps of Engineers, after a three-year study of levee rehabilitation alternatives, estimates it would cost nearly $1 billion to rebuild the entire levee system. The State Department of Water Resources (DWR) is presently developing several plans providing varying degrees of flood protection. The final DWR report will be submitted to the Legislature in May 1982.

The Army Corps schedule for current activities is as follows:

Spring 1982 - Submit draft feasibility report to ACE division office in San Francisco.

Summer 1982 - If draft report is approved by division it will be released to the public.

Summer 1982 - Hold public meetings and workshops (allows for a 30 day prior review).

Fall 1982 - Address comments received in hearings.

Fall 1982 - Submit final report to the division office; this starts the formal review process which eventually ends in Washington.

The major issues and problems facing the Delta are summarized below:

1. Some levees are over 100 years old; many are in poor condition and require rebuilding.

2. As subsidence of islands continues, hydrostatic forces on the out-side wall of the levees will increase (independent of high tide or flood conditions) and levees will fail.

3. Without the integrity of the levee system, the Delta will eventually flood and be transformed into a shallow, inland, saline Bay.

Economic and financial aspects of the problem include:

1. A $400 million agricultural industry would be lost.

2. The striped bass and salmon fisheries would be jeopardized.

3. Water quality for domestic, municipal and other agricultural uses would be diminished.

4. Recreational use (primarily boat marinas) would be altered.

5. Federal money for levee work will become difficult to obtain.

6. There will be no state money available if $1 billion is needed for Peripheral Canal construction.

7. Local levee and reclamation districts do not have the financial ability to handle the problem.

Numerous governmental agencies are involved in decisions and actions concerning the Delta and its problems. There are six local water districts, fifty levee districts, five county governments and a coordinating Delta Advisory Planning Council (DAPC). These multiple jurisdictions and interests face the following problems:

1. Governmental bodies are currently acting in a reactive/crisis mode.

2. There is no machinery for local government to raise sufficient revenues for levee work.

3. DWR estimated that in 1975 the average annual expenditure by local levee and reclamation districts for levee maintenance was $250,000. This is substantially less than the approximate $4 million the districts can assess.

4. The existing "Way Program" (Chapter 717, Statutes of 1973) provides inadequate sums of money for the state match to local districts for levee work.

5. Local governments resist the state mandating comprehensive planning agencies (i.e., regional governments) if it in fact involves creating another level of government.

6. Local versus regional versus statewide interests/benefits have not been clarified; thus cost-sharing is difficult to resolve.

Options for Legislative Action

State law requires that the Delta be preserved in essentially its present condition. Whether that means all the islands must be preserved is a disputed question. One suggestion is to create polders (groups of islands protected by master levees), with possibly some of the most vulnerable areas excluded. The Army Corps and DWR reports (both expected in mid-1982) will include this scenario as one of several alternatives.

Options for legislative action at this time are as follows:

1. Create a Delta Task Force to examine various alternatives for raising revenues to repair levees. Duties of the body would include, but not be limited to, the following:

   a) Consider establishment of a Delta Preservation District with broad powers to raise revenues. Examine ABAG, BCDC, Tahoe, and other regional entities as models for Delta management.

   b) Review Army Corps and DWR study reports when available in 1982.

c) Develop a 20-30 year rehabilitation program with priorities for expenditures.

d) Consider general principles for cost allocations (as outlined on pages 43-49) and develop an equitable cost-sharing formula for the levee rehabilitation project.

e) Report back to the Legislature within one year with recommendations.

2. Augment the "Way Program" to make more state matching money available.

3. Consider seed money for local efforts to start working on highest priority levees. State would ultimately match all money raised locally.

4. Reconsider Assembly Bill 402 (Norman Waters) for the purpose of placing a $250 million Delta Levee Bond Act on the November 1982 ballot.

5. Consider legislation to implement certain recommendations in the Delta Habitat Plan and to implement the "compatible and consistent" policies of the Delta Master Recreation Plan, the Delta Action Plan, and the Delta Waterways Use Program.

Option 1 is the recommended course of action. The other actions are not excluded by the formation of a Task Force and are recommended as concurrent measures. (See Appendix D for draft legislation to create Task Force).

BACKGROUND

Geographic Setting

The Sacramento-San Joaquin Delta (Delta) consists of approximately 60 major islands and tracts (ranging in size from a few acres to 15,000 acres) which are separated by some 700 miles of interconnecting waterways. This vast network of meandering channels is located at the confluence of the Sacramento and San Joaquin Rivers, which together carry the volume of more than one-third of the state's entire watershed.

The legal boundaries of the Delta are described in the Delta Protection Act of 1959 (Section 12220 of the California Water Code) to include all the lands shown on a map prepared by the Department of Water Resources titled "Sacramento-San Joaquin Delta," dated May 26, 1959 (see Figure 1).

As defined by statute, the Delta contains 738,000 acres in six counties: San Joaquin (318,000 acres), Contra Costa (117,000), Sacramento (110,000), Solano (97,000), Yolo (91,000), and Alameda (5,000).

This 1,100 square mile area is relatively flat land with elevations reaching 20 feet above sea level on the periphery and 25 feet below sea level in the central portions known as the Delta lowlands. The reclaimed land, which is intensively farmed, is protected from the surrounding waterways by 1,100 miles of man-made levees.

History

In 1839 when John Sutter first explored the area looking for farm land, the Delta was a vast tule marsh, most of which was inundated daily by tidal waters. One historical account includes the following description:

> Originally a marsh-filled basin where over one-half of the land was at or below mean sea level, the Delta was about three-fifths awash with an ordinary tide. Local relief was slight, with low natural levees bordering the major streams. Tules, a fresh water perennial marsh plant, provided the dominant Delta vegetation.
>
> The monotony of the green or brown canebrake-like vegetation was broken by channel and pond surfaces and by strips of alluvial land where woody shrubs and trees and herbaceous annuals grew. This natural levee cover consisted of coarse bunch grasses, willows, blackberry and wild rose thickets, and galleries of oak, sycamore, alder, walnut, and cottonwood.[1]

Before 1850, landowners were reluctant to build levees because of the lack of adequate laws giving them clear title to the swamp and overflow land. However, the federal "Arkansas Act" of 1850 granted title of swamp and overflow land to certain states on the condition that the proceeds from the sale of such lands would be used to assist reclamation. Reclamation of the Delta was accelerated in 1861 by passage of the California "Swampland Act" which allowed the state to offer patents to those who would drain and reclaim river-bottom lands.

Reclamation of low islands and marshes on the periphery of the Delta started with construction of artificial levees on top of the old natural ones. After 1876, pumps were used to control the water levels on reclaimed land. Introduction of the clamshell dredge in 1879 allowed

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[1] "The Sacramento-San Joaquin Delta: The Evolution and Implementation of Water Policy." W.T. Jackson and A.M. Paterson. U.C. Davis Water Resources Center. June, 1977.

more extensive reclamation toward the center of Delta. The shallow natural channels continued to be dredged to form levees for new islands until by 1930 the Delta was fully reclaimed for intensive agriculture.

California farmers have long recognized that the excellent peat soil and the abundance of fresh water year round makes the Delta region of the Sacramento and San Joaquin Rivers highly desirable agricultural land, if the area can be protected from tides and floods. Delta farms were thus created by building levees around the marsh areas, draining the water, burning off the tules, drying the peat, and cultivating the soil.

Land Use and Demography

The Delta lowlands are defined as the area which lies between five feet above and twenty feet below sea level. Of the lowlands, which comprise 63 percent (465,000 acres) of the statutory Delta, approximately 80 percent is cropped, 9 percent is water surface and 10 percent is native vegetation.

With few exceptions, the towns and orchards in the Delta are located above the 5 foot contour. Although originally agricultural, the upland areas, particularly in the western Delta, have undergone steady industrialization and urbanization. At present, only about 1 percent of the Delta has been developed for urban use. Cities, industries, freeways and railroads surround the Delta, but relatively few people live in the heart of the area. There is almost no industry in the Delta lowlands. Packing of agricultural products is done in small sheds scattered throughout the Delta; packed produce is then shipped by truck.

In 1981 the U.S. Army Corps of Engineers conducted a study of the socio-economic characteristics of the Delta.[2] There are four incorporated cities (total population 98,560 in 1980) in the Delta uplands: Antioch (43,100), Pittsburg (33,000), Brentwood (4,410), and Tracy (18,050). There is only one incorproated town, Isleton (population 930), and about ten villages in the lowlands. The Army Corps study does not include the many houses built on the river side of the levees near Sacramento and Stockton. Just over 11,000 people live in the lowlands according to a 1975 Department of Commerce special census. This represents a 34 percent decline since 1960. There are fewer young people and a greater proportion of people 65 years and older in the Delta than in the state as a whole. Sixty percent of the population earn $10,000 or less.

The Delta lowlands have been zoned for agriculture by the five counties that have jurisdiction. However, the minimum size parcel varies from five acres in Contra Costa County to eighty acres in Sacramento and Solano counties. Very little of the land in Contra Costa County is protected under the Williamson Act (Land Conservation Act of 1965); 90 percent of the Sacramento land is protected; and only half of the San Joaquin County Delta lands are protected.

Levees

Thousands of acres of the Delta lowlands are protected from floods and high tides by a vast network of man-made levees totaling about 1,100 miles in length. Some of these levees are over 100 years old; many are in poor condition and need to be rebuilt.

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[2]"Sacramento-San Joaquin Delta Investigation - Stage 2. Section B - Resources and Economy of the Study Area." U.S. Army Corps of Engineers. September, 1981. (Draft report.)

The original levees were built to reclaim the rich Delta soil and protect it from flooding. Today they serve diverse needs. They protect valuable farms and farmland, cities and towns, industries, recreational developments, highways and railroads, natural gas fields, utilities, major aqueducts and many other works of man from the ravages of floods. The scenic waterways provide a habitat for many species of fish and wildlife and make the Delta one of California's major recreation areas.

The levees built to withstand high tides were no match for California floods and the mining debris brought down from the Placer mines. As levees were built higher and higher, using steampowered equipment to dredge material from channel bottoms, the land contained within was sinking. Over the years, the peat soil, baked by the sun, burned and tilled by humans, oxidized by the air, and eroded by the wind, has subsided to as much as 25 feet below sea level. Seepage through or under levees resulting from hydraulic pressure plagues many islands and has to be pumped back to the channels. Most islands have been flooded at least once due to levee failure.

The present levee system is classified into three categories: project levees, direct agreement levees, and non-project levees.

Project Levees

Approximately 15 percent of the total levee system has been built, rebuilt, or adopted as federal flood control levees ("project levees") and these levees are maintained to federal standards by non-federal interests. The State Reclamation Board provides the non-federal assurances for maintaining these levees. The Department of Water Resources is responsible for inspecting and reporting on the maintenance of the project levees.

Project levees in the Delta total about 375 miles. They are primarily along the Sacramento River from Collinsville to Sacramento, and along the San Joaquin River and its forks between Stockton and Vernalis. These levees are inspected in the spring and in the fall each year under the department's levee inspection program. Except for a foundation problem on Twitchell Island, there are no known critical trouble areas on the project levees in the Delta.

Direct Agreement Levees

Levees that were constructed as part of a navigation project or rebuilt by the federal government following floods ("direct agreement levees") comprise 10 percent of the total system. Non-federal interests (local reclamation on maintenance districts) maintain these levees to standards that are less stringent than those established for "project levees."

This category includes levees along the Stockton Deep Water Ship Channel modified as part of that project. The state has no jurisdiction or responsibility for maintenance of these levees. The slope protection is maintained by the U.S. Army Corps of Engineers, while the integrity of the levees is maintained by the Port of Stockton. Federal expenditures maintain the levees along the Sacramento Ship Channel.

Non-Project Levees

The remaining 75 percent of the levees in the Delta are private levees constructed by private interests. These levees have not been constructed to any design standards and are not maintained to any established maintenance standards, since the cost of maintenance is funded entirely by the landowners. State expenditures authorized by

the Way Bill (1973) and the Nejedly-Mobley Bill (1976) amounting to $1 million were used to reimburse a portion of maintenance costs for non-project levees.

IMPORTANCE OF THE DELTA

At a Sacramento conference on "The Future of the Delta"[3] (March 16-17, 1981), sponsored by the University of California and the Department of Water Resources, participants emphasized the importance of the Delta, not only to the Delta residents, but to Californians and others throughout the nation. It was stated that the Delta was an irreplaceable and fragile resource of nature and man and that without adequate levees, the Delta as we know it today would be lost.

The California Legislature has declared (Section 12981, Water Code) that --

> -- the Delta is endowed with many invaluable and unique resources and that these resources are of major statewide significance, and 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, 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.

Multiple Resource Values

The Delta provides many economic and environmental benefits. It is one of the most fertile agricultural areas in the United States, supporting a wide variety of crops. The area also contains the state's most important high-quality natural gas producing areas; supports one of the

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[3]"The Future of the Delta - Proceedings of a Conference (March 16-17, 1981)." Edited by Anne Sands. U.C. Davis and Department of Water Resources. September, 1981.

state's greatest fishery resources; and provides habitat for over 100 species of waterfowl game and endangered species. The Delta has become one of California's major recreational resources. It provides opportunities for fishing, boating, picnicking, camping, water sports, and sight-seeing.

The Delta channels, particularly the Sacramento and San Joaquin Rivers and the two deep-water channels and ports, support important commerial shipping. Further, the Delta is the hub of the Bureau of Reclamation's Central Valley Project and the California State Water Project which transfer water from northern California to central and southern California for agricultural, municipal, and industrial uses. The Mokelumne Aqueduct which conveys water from the Sierras to the San Francisco Bay Area crosses through the Delta.

Agriculture

The Delta's rich peat soils support a wide variety of crops which significantly contribute to California's economy. Sugar beets, asparagus, potatoes, alfalfa, corn and other crops are valued in excess of $400 million annually.[4] With approximately 524,000 acres in crops and orchards, agriculture is by far the primary land use activity in the Delta.

Prior to 1910, Delta land was mainly used for grazing livestock. As more permanent levees were constructed a diversity of crops were grown in the lowlands, and by 1924 asparagus, grain, hay, and corn

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[4]"Sacramento-San Joaquin Delta Levees Study." Fourth Interim Report. Department of Water Resources. January, 1981.

predominated. Significant amounts of sugar beets, alfalfa, potatoes, onions, beans, tomatoes, nuts and fruit were also grown. Since about 1960, acreage devoted to asparagus has dropped drastically. Currently, corn, grain, hay, alfalfa, and pasture account for more than 75 percent of the crops grown.

The basic causes for this shift from truck crops to field crops are both physical and economic. Drainage is poor because the peat soil has subsided as a result of oxidation, compaction, wind erosion and burning. Nutrition problems in peat soils require added phosphorus, zinc, and potassium. Salt concentrations in the soil due to irrigation practices require frequent leaching. In some places the peat soil has disappeared exposing the lower grade mineral soil below.

Subsiding land has increased the water pressure on the levees which are built on an unstable base. The ever present problem of levee failure has been a significant factor in the cropping practices in the Delta. Other economic problems include costly and poor transportation; absentee landlords who tend to "mine" the land; and high labor costs that cause labor-intensive crops to be displaced by capital-intensive crops.

It has been estimated that 1,266,000 acre/feet of water is used annually to irrigate crops in the lowlands. On the Delta islands much of the irrigation water seeps through the levees into the "spud ditch." This phenomenon is called "sub irrigation." Thus, the quality of the

water in the channels is very important to the farmer. If too much fresh water is diverted from the channels, salt water will invade the area filtering into the ground water and "spud ditches." This has happened many times in the past, particularly during the drought years of the 1930s. In 1975 the costs of irrigation water were from $1.75 to $6.00 per acre/foot in the lowlands.

Recreation

The recreation industry, fish and wildlife included, is intimately tied into Delta levee protection and agricultural land use. Marinas have multiplied over the years until there were approximately 150 of them in 1978, affording almost 11.9 million recreation days, and involving some $73.6 million per year of recreation expenditures.[5]

The joy of the Delta for the people interested in recreation are its myriad of waterways for boating, swimming, and fishing and the tranquility of its sylvan shores. There are more than 700 miles of navigable waterways; small resorts flourish on 24 of the islands and two acres of recreational housing have been built on Bethel Island and Discovery Bay. In 1978, there were 150 boat marinas located within the Delta providing about 10,000 berths, representing a capital investment of $20 million. Pleasure boat registration in the five Delta counties was 82,282 in February 1978. Many boats using the Delta are trailered in from other counties to use the 180 ramps available for boat launching. A DWR survey in 1978 estimated that over 7 million people

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[5]"Sacramento-San Joaquin Delta Outdoor Recreation Survey." E.Z. Cajucom et al., prepared for Department of Water Resources. March, 1980.

used the Delta area, two-thirds of whom said boating and fishing were the prime attractions. Approximately $70 million was spent in the area for recreational purposes. In 1975 the DWR proposed ten additional recreational areas and many new fishing access sites because at that time they found a lack of public recreational facilities.

The lure of the Delta comes from the many channels through and around the islands. Changes in levees would involve impacts on the recreation industry and could result in a lowering of that sector's economic activity. For example, if levees are allowed to break and go unrepaired, small, isolated lakes would form, bringing about a relative decline in the boating and fishing recreation industry.

Fish and Wildlife

Delta waterways support one of the state's greatest fishery resources. Catfish is the Delta's primary resident fish while a variety of anadromous fish (fish that migrate from salt to fresh water to spawn) include Chinook salmon, steelhead, striped bass, American shad, and sturgeon.

Today's Delta is an environment of human origin with an introduced ecology that is artifically maintained. During the 1870's and early 1880's, three popular sport fishes -- striped bass, white catfish, and American shad -- were transported from the East Coast and planted in the Delta. Protection of these species has become a major concern.

Department of Water Resources Bulletin Number 76 describes the Delta-fishery relationships:

> The Delta comprises a unique and varied environment important to the survival of a large segment of California's fishery resources -- and to the commerical and sport fishing industries they support. Salmon, steelhead, shad, and sturgeon are migratory fish that pass through the Delta on their upstream spawning run. The young later move seaward through the Delta. Striped bass (introduced about one hundred years ago) also migrate from the ocean into the Delta and upstream. From one-third to one-half of Central Valley basin striped bass spawn in the Delta. The remainder spawn upstream from the Delta, but essentially all the young use the Delta channels as a nursery area.[6]

The Delta is also an ideal environment for over two hundred species of birds including five major game birds -- ducks, geese, swans, sandhill cranes and pheasants; thirty-nine species of mammals, nineteen species of reptiles and eight species of amphibians. Preservation of this wild life habitat depends on adequate water quality and necessary plant growth on the levees and on the farm lands in the Delta.

Water

Through the Sacramento-San Joaquin Delta passes the lifeblood of the state -- water for crops, people, fish, wildlife, and factories. These water needs are competitive, and finding ways to meet them is a monumental task.

The process of transferring water through the Delta is a long-fought and complex issue. The array of interest groups is as follows:

-- Southern Californians, who want a dependable supply of good quality water.

-- San Joaquin Valley farmers, who need more surface water to offset their overdraft of groundwater.

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[6]"Delta Water Facilities, Program for Delta Protection and Water Transfer." Bulletin 76, Department of Water Resources. July, 1978.

-- Northern California "counties of water origin," who are jealous of their supply.

-- Delta farmers, whose irrigation supply now depends on cross-Delta transfers. (If the Peripheral Canal is built, this irrigation supply would depend on how the canal is operated.)

-- Contra Costa County and other regional interests, who want to maintain water quality in Delta and San Francisco Bay.

-- Environmentalists and defenders of wildlife, who also are concerned about water flow and quality.

Protection of the Delta environment is considered essential to the general welfare of California and to the acceptance of any program to transfer water supplies across the Delta for export.

The Delta is the key link in water operations for the federal Central Valley Project (CVP) and the State Water Project (SWP), which in an average year draw 5.5 million acre-feet of water across the Delta and into their canals for delivery further south. These two projects have long-term contracts with nearly 90 public agencies serving more than one-quarter of the land area and two-thirds of the population of the state. Thus, almost any controversy confronting water development and water management in California also becomes an issue in the study of Delta alternatives.

The Contra Costa Canal (a unit of the CVP), completed in 1940, was the first use of Delta channels to convey water for export. Diversions from the Delta by the CVP for the San Joaquin Valley began in 1951, the

same year the State Water Project (SWP) was authorized by the Legislature. By 1960, the Delta channels were being used by SWP to transfer water from the Sacramento Valley to the south. The Peripheral Canal was proposed in 1965 by the Interagency Delta Committee as a solution to the water transfer problems in the Delta. After fifteen years of study and many state and federal resolutions concerning water quality standards in the Delta, Senate Bill 200, specifying the Peripheral Canal as the delta transfer facility, passed and was signed by the Governor. Proposition 8, a companion measure to SB 200, was passed by California voters in November, 1980. Almost immediately an anti-canal referendum calling for a statewide vote on SB 200 qualified and the election has been set for June, 1982.

The level of salinity in the Delta is dependent on the flow of fresh water from the Central Valley rivers. This flow has been reduced drastically as more of the river water is used upstream or impounded by dams. Releases from the reservoirs are necessary during the dry season to block salt water intrusion coming upstream from the San Francisco Bay. Water quality standards for the Delta were first suggested by the DWR in 1931, a drought year with massive salt water intrusion. However, it was not until 1965 that regulatory standards were set to protect Delta agriculture, and not until 1971 that water quality standards sufficient for protection of wildlife, agriculture, municipal and industrial uses were established. There is still concern, however, that during years of drought the quality of water in the Delta will be sacrificed in order to meet water requirements elsewhere.

The Department of Fish and Game (DFG) reports that CVP and SWP diversions from the Delta, which are occurring without an adequate Delta water transfer facility, are having an adverse impact on existing channels and Delta fisheries. In large part, this condition is due to pumping water directly from the southern Delta channel system. Under California law, Delta water requirements for reasonable uses must be met before any water is exported by the state. The Department of Water Resources (DWR) is also obligated to make all reasonable efforts to deliver water to meet the reasonable needs in SWP service areas up to the contract limits.

The State Delta Protection Act (1959) and decisions of the State Water Resources Control Board (SWRCB) spell out the need to preserve and provide good water quality throughout Delta channels to protect the area's reasonable beneficial uses and environmental balances. DWR is obligated to provide water from the SWP to comply with these requirements. Yet, the federal government has historically refused to dedicate a portion of the CVP water supply to furnish a share of the water needed to protect the Delta.

Although the most important in-Delta issues are defining acceptable diversion levels, protecting the fishery, and meeting reasonable water quality requirements, other important issues that impact water management in the Delta are: (1) population growth and distribution, (2) the future of San Joaquin Valley agriculture, (3) water conservation, (4) waste water reclamation; (5) coordination of SWP and CVP operation,

(6) use of groundwater storage, (7) preservation of North Coast rivers, (8) reducing overdraft of San Joaquin Valley ground water basins, and (9) managing the salt build-up in the San Joaquin Valley.

Commercial Shipping

Both the Port of Sacramento and the Port of Stockton lie within the Delta boundaries. The Army Corps of Engineers maintains 30-foot deep ship channels to both Sacramento and Stockton, enabling oceangoing vessels to berth at these two inland ports. During the 1980 fiscal year the Port of Sacramento handled approximately 2.4 million tons of cargo from about 145 vessel stops with a value of $310,910,733. Projected figures for the 1981 fiscal year are 3.25 million tons, 185 vessel calls, and $775,000,000 cargo value. Total operating revenues in the 1980 fiscal year were $9,077,897 with a net income of $2,043,787. Port district equity at the end of the year was $16,614,743.

During the 1980 fiscal year the Port of Stockton received $12,844,335 in revenues and had a net income of $818,910. Total waterborne cargoes equaled about 2.4 million metric tons (3.8 million metric tons if pipeline cargo is included). The Port of Stockton is seeking federal funds to begin a channel deepening project (to 35 feet) which some view as critical to the long-range planning and prosperity of the Port, since it will allow larger ships with larger cargo volumes to navigate the channel. Construction of the project began in 1974, but was delayed while environmental and water quality questions were investigated.

Land Transportation and Utilities

Although parts of the Delta are remote, much of it is vital for transportation. Thirty-seven of fifty-one islands protected by non-project levees have public roads, including major state highways 4 and 12 which bisect the Delta. Highway 160, the "River Road" follows the Sacramento River, while Highway 84 traverses north to south through Yolo and Solano counties. Interstate 5 skirts the eastern side of the Delta.

Four railroad companies have lines which traverse eleven of the Delta islands: Southern Pacific, Western Pacific, Sacramento Northern, and the Atchison, Topeka, and Santa Fe. In addition, sixteen islands are crossed by aquaducts or pipelines and eighteen by transmission lines. Fifteen islands have gas wells and McDonald Island is being used for underground storage of both domestic and Canadian gas. The utilities and the railroads pay a local district tax for levee maintenance. In addition, the railroad maintains its own right of way.

Oil and Gas

The Delta area contains some of the most productive natural gas fields in the state. Total 1979 production from the gas fields located either wholly or mostly within the Delta was 91.1 billion cubic feet, about 27 percent of the state's total onshore gas production of 337.5 billion cubic feet. According to the Division of Oil and Gas,[7] the Delta has estimated recoverable gas reserves of 802 billion cubic feet, 18 percent of the state's 4.4 trillion cubic feet of gas

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[7] "65th Annual Report of the State Oil and Gas Supervisor," (Publication No. PR06). Division of Oil and Gas. 1979.

reserves. The Delta is not a major producer of crude oil. Its 1979 production of 62,358 barrels amount to far less than one percent of the total state production for that year.

Most of the Delta's gas comes from five fields: Rio Vista Gas, Union Island Gas, McDonald Island Gas, Lindsey Slough Gas, and Lathrop Gas. The Rio Vista, Union Island, and McDonald Island fields ranked first, second and third as the most productive non-associated (dry) gas fields in the state. Lindsey Slough Gas field ranked seventh. The five largest fields collectively accounted for 91 percent of the Delta's gas in 1979.

Historical and Other Cultural Resources

A series of six reports evaluating historical resources in the Delta were prepared in 1978 by private consultants for the State Lands Commission in conjunction with a project to remove navigation hazards.[8] The most notable historic artifacts observed and researched during the project were classified into two categories: (1) artifacts in the waterways, and (2) artifacts adjacent to the waterways. The first group was further subdivided into pilings and boats. This study covered only a portion of the total Delta and focused on the waterways. Nevertheless, numerous historical resources were identified. Equivalent values were not assigned.

The Delta Advisory Planning Council (DAPC) prepared a report on significant historic, archaeological and cultural resources, which was issued in May 1974. The list was complied from existing material

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[8]"Historical Evaluation of the Delta Waterways." A. Paterson et al., prepared for State Lands Commission. December, 1978.

without further field investigations. It contains 81 Delta features listed on historic registries.

Finally, the Delta Action Plan, issued by DAPC in 1976, contains a list of historic resource areas by county which covers more than 100 structures.

PROBLEMS/ISSUES

The many problems facing the Delta today include:

-- flood control

-- levee maintenance

-- earthquake hazards

-- subsidence control

-- destruction of levee vegetation

-- protection of fish and wildlife habitat

-- shortage of public access and recreation facilities

-- lack of adequate land use controls

-- inadequate funds for levee improvement and maintenance.

Other issues include:

-- cost sharing

-- farming practices

-- damage from boat wakes

-- trepass on private lands

-- determination of public lands

-- historical resources

Many miles of levees are in critical need of repair or rehabilitation. Land subsidence is continuing to lower many Delta islands, making protection and continued reclamation increasingly difficult and costly. Trees, shrubs and grasses which provide much of the natural beauty of

the Delta and valuable wildlife habitat are being destroyed. Public access and recreation facilities along the levees are limited. These problems occur primarily because the funding for levee improvement and maintenance is inadequate.

There are at least three groups of issues, each with its own set of facts and conflicting interests:

1. Questions of land subsidence and levee maintenance, which affect agriculture in the short run and the physical existence of the Delta in the long run.

2. Questions of water transfer through the Delta, which affect quantity and quality of much of California's water supply.

3. Questions of comprehensive planning for the Delta, which affect recreation, wildlife, utility corridors, and shipping as well as agriculture and water supply.

These issues are inter-connected and each bears on the overall question of Delta preservation. The result is a classic problem in public decisionmaking.

Although the present day Delta is man-made, nature still must be reckoned with. In fact, natural forces are relentlessly changing the system so that -- unless some expensive changes are made -- the Delta

will turn into a shallow, inland bay, probably dominated by saline water. Ironically, even that situation would not be "natural," since the area originally was a fresh water marsh.

Flood Control

Flooding has been a major problem in the Delta since the first levees were constructed in the early 1860's. Flood protection provided by the present Delta levee system is generally inadequate except for the areas protected by federal project levees. Most of the private or nonproject levees are unstable as a result of land subsidence, and are being eroded by flood-flows and wavewash from tides, winds and boat wakes. Most of the levees lack sufficient freeboard during high-water periods and many miles have deteriorated. If one island is flooded and its levees lost, the adjacent island levees are more vulnerable to wind-wave erosion. There is a potential domino effect.

More than twenty-five islands scattered throughout the Delta have flooded in the past fifty years, many of them several times. In the past, flood waters from the Central Valley rivers and very high tides from San Francisco Bay were the main causes of flooding, but building of dams and reservoirs has alleviated some of the problem. Today flooding of the Delta islands is mainly due to the increased hydrostatic pressure on the levees. This pressure increase is caused by lowering ground water levels in the island interior as a result of land subsidence. Approximately half of the island interiors are between five feet and twenty feet below sea level. In 1938, Franks Tract (3,500 acres)

flooded and was never reclaimed. In 1938 six islands and tracts flooded and in 1955 seven (approximately 38,000 acres) flooded and were reclaimed.

History of Flooding

The following significant floods have occurred in recent times:

1. Twitchell/Sherman/Mildred Islands -- January 1969.

2. Brannan/Andrus -- June 21, 1972. A levee broke on the San Joaquin River during low flow, flooding the town of Isleton. Total restoration costs and damages resulting from the Brannan/Andrus flood is estimated to be over $20 million.

3. Webb/Holland/Prospect/Deadhorse -- January 18, 1980. A total of 5,500 acres on Webb and 4,200 acres on Holland flooded during high water stages.

4. Lower Jones Tract -- September 26, 1980. Levee failure under normal summer conditions flooded 5,200 acres.

5. Upper Jones Tract -- October 23, 1980. The Santa Fe Railroad embankment separating Lower Jones and Upper Jones failed.

Although 1980 was not generally considered a year of large floods in California, greater flood damage occurred in the Delta during 1980 than in any other year of recorded history. Of the six islands and tracts that flooded in 1980, five with a total of 30,956 acres had nonproject levees, four flooded during high water stages and two flooded

in normal summer conditions. State and federal aid of $34 million will be spent on these islands to repair the damaged levees, pump out the water and repair the flood damage. The pumping costs alone on one island, which was foreign owned, exceeded three times the appraised value of the land.

Inadequate Levee Maintenance

Levee maintenance for the Sacramento Deep Water Ship Channel is the responsibility of the federal government. The Port of Stockton has a direct agreement with the federal government to repair and restore levees along the Stockton Deep Water Ship Channel and San Joaquin River. Fifteen percent of the private levees agencies have entered into an agreement with the federal government to maintain their levees to U.S. specifications. These are called "project levees." The remaining 75 percent of the Delta island levees are called "nonproject levees," and are to be maintained by the landowners or by special districts created for that purpose; the state has no jurisdiction or responsibility for the maintenance of these levees.

Maintenance of levees in the Delta varies from very good to poor depending on the attitude and financial capability of the maintaining agency. The Department of Water Resources (DWR) estimated that in 1975 the average annual expenditure by local levee and reclamation districts for levee maintenance in the Delta was $250,000. This is substantially less than the approximately $4 million the districts can assess.

Following the levee break at Lower Jones Tract on September 26, 1980, Ronald B. Robie, Director of the Department of Water Resources, ordered a special inspection of the levees in the Sacramento-San Joaquin

Delta to try to identify sites that could be problems during the forthcoming 1980-81 flood season. The inspection revealed that four islands had very poor levees, twenty-eight had poor levees, and twenty islands had fair levees; none were rated as good.[9]

During times of emergency the districts can ask for state assistance, and if a disaster occurs, they generally are eligible for state and federal financial assistance. As an interim means to assist the local agencies, Senate Bill 541 (Way) was enacted as Chapter 717, Statutes of 1973. The bill provided for state reimbursement of a portion of the maintenance costs for nonproject levees.

The "Way" program is contained in the State Water Code. Pertinent sections read as follows:

> 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.
>
> 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.
>
> 12984. The department shall develop and submit to the board, for adoption by the board, criteria for the maintenance and improvement of nonproject levees. Such criteria shall vary as required to meet specific conditions and shall be multipurpose in nature, and include environmental considerations, when feasible.

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[9]"Findings and Recommendations Based on the Inspection of Delta Levees During October 1980." Department of Water Resources. December, 1980.

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

a) No costs incurred shall be reimbursed if the entire cost incurred per mile of levee is five hundred dollars ($500) or less.

b) Any costs incurred in excess of five hundred dollars ($500) per mile of levee shall be reimbursed if the entire cost incurred per mile of levee is greater than five hundred dollars ($500) but not more than one thousand dollars ($1,000).

c) Fifty percent of any costs incurred shall be reimbursed if the entire cost incurred per mile of levee is greater than one thousand dollars ($1,000).

Levee maintenance is being performed by many agencies, districts and landowners. The quality of maintenance of nonproject levees varies according to the maintenance standards followed by the local maintaining agency. Since most maintenance organizations seek to minimize costs, few of the levees are maintained to provide a high level of flood protection and to preserve vegetation.

Subsidence

In addition to levee protection, land subsidence has been a major factor in setting the long run degradation and rehabilitation costs of the land. Much of the Delta is composed of organic peat material, which is ideal for agriculture purposes, but is poor foundation material for levees and structures. The peat has an average thickness of about 20 feet with a maximum depth of over 50 feet. The organic soil is constantly decomposing and subsiding, compounding flood problems.

Initially, levees were small structures with little weight or substance. Over the years, however the reclaimed lands have sunk from near sea-level to depths as much as 25 feet. At the "Future of the

Delta" conference, one scientist estimated that, if current rates of disturbance of the organic-peat soils went unchecked, ground levels could drop another 20-30 feet during the next 50 years.

Chapter 970, Statutes of 1976, called for a subsidence study and control program if shown to be feasible. Section 2 of the legislation reads as follows:

> Section 2. The Legislature finds and declares that:
>
> a) Peatlands in the Sacramento-San Joaquin Delta are subsiding up to three inches per year due to soil oxidation, compaction, and wind erosion.
>
> b) Because of continued subsidence, much of the delta lands have fallen below sea level, and larger and larger levees have had to be constructed in order to restrain tidal and flood waters from permanently inundating these valuable delta agricultural lands.
>
> c) Without major levee works or without preventing subsidence, local levee maintenance districts will have increased economic difficulties in maintaining a viable levee system.
>
> d) A partial alternative to costly state and federal major levee works would be a subsidence control program undertaken along the landside of levees, if such control is determined to be economically and engineeringly viable.

DWR studies indicate the islands in the central and western Delta are subsiding at a rate of about 3 inches per year.[10] The subsidence is caused primarily by oxidation of the peat soil when it is exposed to the atmosphere during agricultural operations, shrinkage resulting from the lowering of water tables, wind erosion, and consolidation resulting from the withdrawal of groundwater and natural gas. As the subsidence continues, hydrostatic pressure builds up on the channel side of the levees

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[10]"Subsidence of Organic Soils in the Sacramento-San Joaquin Delta." Department of Water Resources, Central District. August, 1980.

until a stability failure occurs. In the case of the Webb Tract failure, the hydrostatic pressures were so great that sections of levees as large as a house were uplifted and deposited inland on the island floor.

The Department of Water Resources reports that present rates of subsidence of Delta organic soils may be reduced by up to 30 percent, but probably not more than that as long as agricultural use of the islands and tracts continues. Ways to reduce subsidence include maintenance of groundwater at higher levels and various practices to reduce wind erosion.[11]

Earthquake Hazards

As far as is known, earthquakes have not damaged the Delta levees; however, because the levees in the lowlands of the Delta are founded on and constructed of unconsolidated peat and silt soils of low density, low shear strength, and high moisture content, there is a potential for earthquake damage.[12] During a major earthquake, these water-saturated materials may be subjected to liquefaction, a reaction of soil and water which is similar to the movement of quicksand. Earthquake-induced seiches, or oscillations of the water surface, also could develop in the network of sloughs and river channels during a major earthquake, causing overtopping of the levees.

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[11] "Causes of Subsidence in the Sacramento-San Joaquin Delta and a Strategy For Controlling Its Rate." H.K. Burke prepared for Department of Water Resources, Central District. September, 1980.

[12] "Seismicity Hazards in the Sacramento-San Joaquin Delta." Department of Water Resources, Central District. October, 1980.

Water Quality

Since man has been working and living in the Delta region and along the shores of Suisun Bay, the limits and control of salt water penetration have been issues of major importance. Although the Delta was formerly a tidal swamp, its waters remained predominantly fresh. One of the factors determining the limits of ocean salinity was, and is, streamflow -- the volume of water travelling down the Sacramento and San Joaquin Rivers into the Delta and Suisun Bay. As fresh water flows increase, salt water is flushed out, while low flows allow salinity to move up the rivers. Because precipitation and runoff are concentrated in a wet season extending from December through May, streamflow is subject to normal seasonal variations, reaching a low point late in the summer. As the rivers turn sluggish during the hot, dry months of summer, ocean salinity finds decreased resistance to its upriver advance, resulting in a seasonal pattern of saline encroachment that corresponds closely to changes in the streamflow.

Because the Delta is open to the San Francisco Bay, and because the Pacific Ocean and its channels are below sea level, it never has a shortage of water. If the inflow from the Central Valley is insufficient to meet the needs of the Delta, saline water from the bay fills the Delta from the west. Thus, the water problem in the Delta becomes one of poor water quality, not quantity. Today, degradation by agricultural, municipal, and industrial waste discharges in the San Francisco Bay-Delta area compounds this problem.

Since the Delta's supply of usable water depends on the magnitude of Delta outflows, whatever affects these outflows affects the Delta's water supply. During the 24-year period from 1920 to 1944, there were seven years of severe salinity intrusion in the interior Delta. As the use of water upstream and export from the Delta has steadily increased, average annual Delta outflow has been steadily reduced. However, since 1944 the CVP, and more recently the SWP, storage reservoirs in Northern California have provided supplemental water to augment the Delta outflows needed to repel ocean salinity during low flow periods. Salt water is generally controlled to the western Delta to protect the quality of water at the export pumps and in accordance with applicable water quality standards. In 1976 and 1977, however, rainfall and snowmelt reaching the Delta fell to unprecedented low levels and water available for both salinity control and export was reduced.

Although tidal action is obviously affected and opposed by streamflow, it is also governed by the volume of the tidal basin. The Delta and Suisun Bay are part of a tidal basin that reaches from the Golden Gate to the highest point on the rivers where the rise and fall of the tide can be detected. On the Sacramento River a tidal influence has been observed as far north as Verona, near the mouth of the Feather River. Tidal flow is stronger in, and the upriver movement of ocean salinity is encouraged by, a large tidal basin and restricted by a small one.

Ocean salinity intrusion into the Delta was first noted in 1841 and was recognized by the early settlers as a potential problem to water supplies. A salt water barrier to combat this problem was first proposed

in the 1860's. Since that time, there have been numerous studies of means for controlling salinity intrusion and otherwise improving the management of the water resources of the Delta for the benefit of all Californians.[13]

Physcial barriers to separate salt and fresh water were frequently recommended in early studies. In 1931, it was concluded that constructing a barrier was not economically justified. That same year it was also concluded that the Delta could be protected from salinity intrusion and be assured of an ample and dependable water supply if mountain storage reservoirs were used to provide water for controlling the rate of Delta outflow. It was further concluded that facilities and/or channel improvements would be needed in the north Delta to facilitate water conveyance across the Delta for use in the San Joaquin Basin as part of the original State Water Plan. These conclusions eventually led to the construction (as part of the federal CVP) of Shasta Reservoir on the upper Sacramento River and the one-mile Delta Cross Channel near Walnut Grove to provide better quality water at the intakes to the Contra Costa Canal at Rock Slough and the Delta-Mendota Canal near Tracy.

During the 1940's and 1950's salt water barriers at numerous sites on the Bay and Delta system were again studied in detail. In 1955 it was concluded that barriers in the San Francisco Bay system would not be

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[13]"The Sacramento-San Joaquin Delta: The Evolution and Implementation of Water Policy." W.T. Jackson and A.M. Paterson. U.C. Davis Water Resources Center. June, 1977.

functionally feasible due to uncertainty of the quality of water in the barrier pool, and that further barrier consideration should be limited to, or upstream from, the Chipps Island site at the outlet of the Delta.

The Legislature on several occasions has established water quality policy for the Delta. Water Code Sections 12200 - 12205 read as follows:

> Section 12200. Legislative Findings and Declaration.
>
> 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-deficit 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 orginates is gathered in the Delta and thereby provides a common source of fresh water supply for water-deficit 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.
>
> Section 12201. Necessity of Maintenance of Water Supply.
>
> 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.

Section 12202. Salinity Control and Adequate Water Supply; Substitute Water Supply, Delivery.

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.

Section 12203. Diversion of Waters From Channels of Delta.

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.

Section 12204. Exportation of Water from Delta.

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.

Section 12205. Storage of Water; Integration of Operation and Management of Release of Water.

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.

U.S. Army Corps studies relative to hydraulic and salinity effects of hypothetical polder (two or more islands) systems and island inundations are in progress. One study examined the probable salinity conditions that might have occurred as a result of a hypothetical "domino" effect, using data compiled from the Andrus/Brannan Islands flood of June 1972.

Data contained in the Corps' report on the proposed deepening of the Stockton Deep Water Channel is being reviewed relative to the possible use of dredging methods to reconstruct Delta levees. The major impact of dredging would be local, short-term turbidity and the disturbance of heavy metals and other toxic materials. If a construction plan is developed that provides for the use of imported fill material, water quality is not expected to be a problem.

Ongoing water quality studies are examining the effects of other factors, including pumping plant operations, Peripheral Canal and navigation channel construction. Additional hydraulic studies at the Corps' test model in Sausalito are scheduled for 1982.

If severe island flooding were to occur (resulting in channels being replaced by lakes), several major changes are likely to occur: (1) a relative decline in the boating and fishing recreation industry as we now know it, (2) an increase in the demand for an already limited developed water supply, and (3) a change in the hydrology of the entire Delta area with profound effect on possible water transfers to the San Joaquin Valley and on the water quality of the Bay Area. For example, lakes would cause an increase in the rate of evaporation over the channel surface exposure and necessitate additional releases of fresh water from the northern part of the state to offset an accelerated salt water intrusion in the Delta.

The water quality issues remain a complex and highly important consideration in any Delta activity. The State Water Resources Control Board is the agency in California responsible for water quality. The

board's famed Water Rights Decision 1485 of 1978 requires that water quality in the Delta be maintained as if the CVP and SWP had not been built ("pre-project conditions").

Levee Vegetation

Until recently, the standard technique for levee maintenance was to strip off all vegetation. This stripping allowed relatively easy regular inspection of the levee slopes for danger signals such as cracks, erosion and animal burrows, and allowed for routine corrective operations. This method of maintenance, while more thorough and less costly, has caused a growing number of protests from those mainly concerned with the aesthetic, wildlife and recreational uses of the levees.

Trees, shrubs and other vegetation are aesthetically pleasing and provide shade and separation for recreationists. They also provide habitat for wildlife and, in some instances, can provide erosion control to levee slopes.[14] The Corps of Engineers and the Reclamation Board have adopted standards which allow the retention of brush and small trees on the waterward levee slopes to prevent erosion and wavewash.

Vegetation increases the problems and costs of levee inspection and maintenance, however. Large trees near the water's edge often topple over during heavy winds, breaking away huge chunks of the levee and subjecting it to accelerated erosion. Heavy growth on the levee slopes impedes careful inspection and prevents the use of economical equipment for repair and routine maintenance. This growth also hinders emergency work during flood stage.

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[14]"Use of Vegetation to Reduce Levee Erosion in the Sacramento-San Joaquin Delta." U.C. Davis prepared for Department of Water Resources. June, 1979.

Recreation

The Delta is becoming increasingly popular for water-oriented recreation activities. The state estimates that 40 million people will visit the Delta annually by the year 2000 if facilities are available; however, there are only limited facilities available to accommodate this growing demand.[15] There are two problems -- inadequate access for land-based users (lack of public roads to the interior Delta), and a lack of public recreation facilities, such as picnic sites, swimming beaches, hiking trails, boater destination areas, bank fishing areas, and public hunting areas. Most facilities are provided by private enterprise and are oriented toward boating activities. Inadequate facilities cause an overflow of recreationists onto private lands, resulting in vandalism of private property, damage to levees, littering, and pollution of the waterways. Consequently, landowners' opposition to public use of the levees has intensified.

Land Use Planning

The individual counties and cities in the Delta are independently responsible for local land use regulation and planning. The Delta Advisory Planning Commission (DAPC), formed in October 1972 by a joint exercise of powers agreement between five Delta counties serves as a coordinating body, but lacks enforcement powers. The 19-member council is composed entirely of local government representatives.

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[15] "Sacramento-San Joaquin Delta Recreation Concept Plan." M.A. Geidel and S.J. Moore prepared for Department of Water Resources. January, 1981.

Questions have been raised about the effectiveness of DAPC as a regional association since adoption of the 1976 Delta Action Plan has not been a vehicle for local adoption or implementation. Charges have also been levied that numerous, and often uncoordinated, federal, state, and local programs initiated by single-purpose agencies have resulted in uneven and inadequate attention to the land use problems of Delta.

In addition to the failure of the various Boards of Supervisors to approve the Delta Action Plan, the following plans and programs have not been acted upon:

1) Delta Master Recreation Plan
2) Delta Waterways Use Program
3) Delta Habitat Plan

A working paper on a proposed "Delta Conservation Act of 1982" has been prepared by Bruce E. Jones under contract to the California Department of Fish and Game and the U.S. Fish and Wildlife Service. In its present form the document does not necessarily represent the position of any state or federal agency.

The working paper outlines proposed legislation with the intention of providing "Background and guidance" for implementing the three recommendations in the Delta Habitat Plan. This paper recommends that:

1) Legislation be enacted to require local governments of the Delta to develop, adopt, and implement "Local Delta Programs."

2) An "Office of Delta Coordination" be established within the Resources Agency.

3) Local governments of the Delta adopt the significant resource areas identified in the Habitat Plan as part of the open space/conservation elements of their general plans and protect such areas with appropriate zoning.

Legislation is also proposed to implement the "compatible and consistent" policies of the Delta Master Recreation Plan, the Delta Action Plan, the Delta Waterways Use Program, and the Plan For Improvement of the Delta Levees.

The proposed legislation would create no new agencies and would leave land use decisions as the responsibility of local governments with state overview to ensure minimum standards. State responsibilities would benerally be limited to certifying "local Delta programs" for each county, nominating significant resource areas for review, and monitoring of conformance.

There is an obvious need for a regional land use plan for the entire Delta area. Because of the lack of such a plan, uncontrolled encroachment of urban development is now taking place into areas which may be better suited for agriculture or open space. This, in turn, causes difficulties in developing a plan for the level of flood protection to be provided to each area within the Delta.

Inadequate Financing

One of the major problems facing the Delta today is the lack of funds to develop and maintain an adequate, multiple-purpose levee system. At present, the landowners or local levee maintenance districts

bear the full costs of improvement and maintenance of nonproject levees. If multiple-purpose levees are to be developed, an equitable means of obtaining adequate financing must be found.

It will be difficult to fund a massive rehabilitation project. In addition to the large federal expenditures which will be required, the federal government looks to state and local agencies to share the construction costs and to sponsor the recreation component and assure operation and maintenance of the completed project. Also, local entities will be expected to donate rights-of-way for levee construction.

The total capital cost of protecting all islands and tracts has increased substantially over the last few years and is now estimated at about $800 million. By the time such a project is implemented, this cost could reach $1 billion.

Conventional flood control project analyses have not yielded sufficient economic benefit values to justify such a project. The Delta is an unusual area of statewide importance, however, and a different, unconventional project analysis may be justified. Nevertheless, with such an expensive project, hard questions must be asked as to the appropriate course of action.

A BRIEF HISTORY OF GOVERNMENT INVOLVEMENT

Numerous governmental agencies are involved in decisions and actions concerning the Delta and its problems. There are six local water districts, fifty levee districts, five county governments, the State Water Project, the State Water Resource Conservation Board, the Federal Bureau of Reclamation (Central Valley Project) and the U.S. Army Corps of Engineers. These groups frequently have conflicting plans for the area, see the role of the Delta differently, and often have divergent regulatory functions and goals.

State of California

In December 1960, the Department of Water Resources (DWR) released its preliminary edition of Bulletin 76, "Delta Water Facilities," which compared alternative solutions to Delta problems and identified minimum facilities for successful operation of the State Water Project (SWP). Much opposition developed from the diverse and often conflicting Delta interests, particularly from boating and fishery interests. (See Appendix B for a summary of subsequent legislative and administrative actions concerning the Delta.)

State laws on which SWP and CVP water right permits are based require that all reasonable water needs for the Delta must be met before water becomes available for export to other areas. Fear that Delta needs will not be met is at the heart of the controversy. Some Delta interests believe that other areas of the state have the political leverage to require the export of water which they feel is needed for their own use. These fears have been magnified by the Bureau of Reclamation's historic position that the CVP is not obligated to protect the Delta, if doing so would conflict with other CVP purposes authorized by Congress.

Federal Government

Upon Congressional authorization in 1948 and receipt of funds in 1949, the Corps of Engineers initiated studies of the Sacramento-San Joaquin Delta region. This study was discontinued in 1952 due to lack of non-federal interest and funding restrictions stemming from the Korean conflict.

Studies were resumed in 1962 at the request of the State of California. In 1966, a multiple purpose concept for flood control and recreation was presented to the public. This plan proposed levee rehabilitation to provide protection against a flood having a two percent chance of occurring in any one year (50-year flood protection), and development of recreation facilities in selected areas. Response to this presentation was varied. Recreation interests generally favored the proposal, but landowners indicated their apprehension, primarily because of significant non-federal costs and concern of trespass problems arising from recreation development. The state did not respond to this proposal and, in view of the opposition of the landowners and the lack of interest by the state, the study was discontinued at that time. Congress provided additional money in 1974 and the Corps resumed the Delta investigation.

One of the signficant issues currently being addressed is that of determining the interest of the Corps of Engineers in the Delta. On the basis of economics, there may be a federal interest for at least some of the islands in the study area. Current economics indicate improved flood protection could be provided to about eleven of the islands. The

most significant factor in the resolution of the Corps interest issue may be a determination that the Delta levees are reclamation levees and not flood control levees.

Following the January 1980 Delta floods, the Corps denied the use of PL 84-99 authority to repair and rehabilitate levees in the Delta. This decision was primarily based on the conclusion that the Delta levees were built for tidal control and not flood control. The Department of Water Resources strongly disagreed with this conclusion. The impact of this decision on the Delta investigation remains unclear. This question is now being addressed by the Office of the Chief of Engineers in Washington.

If the Corps determines that the levees are for reclamation, there would be two significant impacts. First, non-federal interests would probably be required to share a greater portion of the project cost. Second, and more importantly, the Corps of Engineers would be involved in a function outside its traditional mission. Spokesmen for the Corps state that it is doubtful if a recommendation for Corps participation in a reclamation project would be forwarded to the Congress. The issue of whether the levees are reclamation or flood control structures may require clarification by Congressional action.

PRESENT ARMY CORPS/DWR STUDY

At the request of the state, and subsequent to the appropriation of funds by Congress, the Sacramento-San Joaquin Delta Investigation was initiated in 1974. The purpose of the investigation was to determine the overall federal and state interest in providing flood protection and recreation facilities in the Delta.

The present DWR Delta Levees Study will complete plans for the improvement of the levees of the Delta as specified in Bulletin No. 192.[16] The Legislature, by Chapter 1302, Statutes of 1976 (Senate Bill 1390), directed the department to submit on or before January 15, 1980, a final report on the plan of improvement which would include recommendations concerning construction, cost sharing, land use, zoning, flood control, recreation, fish and wildlife habitat and aesthetic values. DWR currently plans to complete an interim report on January 15, 1982 and submit a final report to the Legislature on May 1, 1982.

Portions of the joint study being conducted by DWR include input on land subsidence, vegetation, levee maintenance standards, present recreation use, seismic parameters, economics, water quality, current levee maintenance practices, levee profile and cross section surveys.

The Corps of Engineers is providing design and cost estimates, and with cooperation from the department, is developing the alternative plans for levee improvement and rehabilitation. Included in the Corps' work is an evaluation of the economics of these alternatives, the environmental effects, projections of recreation demand, and water quality and hydrologic factors.

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[16]"Plan for Improvement of the Delta Levees." Bulletin 192, Department of Water Resources. May, 1975.

Cost Sharing

Under the traditional cost-sharing methods, the federal government designs and constructs a project. Non-federal interests are responsible for providing all lands, easements and rights-of-way for construction and maintenance of the project, including all relocations and alterations of buildings, houses, roads, highways, bridges, sewers, and utilities. Non-federal interests also pay or contribute in kind with interest a portion of the cost for recreation facilities which, when added to the first cost of recreation lands, would amount to 50 percent of the total first cost of recreation land and facilities.

Regardless of federal participation, there are likely to be substantial costs associated with any Delta project which must somehow be shared among state and local governments and private concerns. The Department of Water Resources has prepared a summary list highlighting points which were raised during the cost-sharing meetings the department sponsored during the Summer of 1981, and which they feel should be considered when designing a cost-sharing program.

General principles advanced at the DWR meetings are as follows:

1. Any cost allocation formula/principles should make allowance for those districts who upgrade their levees with their own finances during the interim period until a long-term levee restoration program is authorized and funded. The districts that do a good job should not be penalized. Also, we do not want to lose the incentive for ongoing improvement of levees pending a restoration program some 10+ years in the future.

2. Districts that do a good job in maintaining their levees should not be asked to subsidize the cost of construction of poorly maintained levees when the cost allocation is made for the levee restoration project.

3. The financial contribution by reclamation districts should be proportional to flood control benefits received by each island/tract. (This approach is a standard flood control project allocation system that does not account for recreation, fish and wildlife.)

4. The cost of a rehabilitation project should be divided by users/area of benefits. Assess each land tract by acre or by mile of nonproject levee, then allocate costs by acre or by mile of nonproject levee. Once these allocations are established (exclusive of recreation, etc.), discuss them with respective reclamation districts.

5. Nonfederal costs could be distributed to the islands/tracts on the basis of the cost of the flood control features.

6. In an allocation of project benefits, and associated proration of costs, the ability of a particular beneficiary group's ability to pay also must be considered.

7. The water quality benefits should be allocated on an island by island basis, with the lower elevation islands being given a greater portion of the water quality benefit. In other words, the effect of an island/tract flooding during a non-floodflow

period should be considered. Some islands/tracts such as Webb Tract should receive a subsidy because of the effect on water quality if they are flooded in the non-floodflow period.

8. An allocation of project benefits may show that SWP/CVP are beneficiaries, which could cause a portion of the costs to be borne by the water contractors.

9. The approach of any plan of participation should be through the reclamation districts -- of which East Bay Municipal Utility District is a part.

10. Ability-to-pay should be a consideration in any financing program, including provisions for a deferment of payments for hardship cases.

Other concerns expressed at the DWR meeting are summarized under the following categories:

Recreation

1. Under Proposition 13 and Proposition 4, it is difficult for counties/cities to make a long-term commitment for recreation facilities when faced with higher priority items for capital outlay (i.e., jails). Sacramento County does not have matching funds required to receive state bond funds for construction of recreation facilities, so Sacramento County is not likely to finance recreation in the Delta.

2. Consideration should be given to formation of a separate county/city level recreation umbrella agency for the Delta -- like a Delta Regional Park Authority. Agency would provide for administrative, local funding, etc.

3. There are only three realistic funding sources -- state, federal, and private. Local agencies cannot be expected to develop funding, but we should consider the potential of private enterprise -- perhaps by providing an incentive to developers in terms of a long-term, lost cost loan program.

4. A fee can be charged for the use of recreation facilities, but it should be recognized that the fee also becomes a disincentive to use those facilities.

5. For public funds to be provided for a levee restoration program, public recreation facilities need to be provided.

Recreation Boating

1. Department of Boating and Waterway's (Cal Boating) funds are derived through DMV. Cal Boating derives about $300,000/year from boat fees/gas tax related to Delta boating. Because Cal Boating has no facilities in the Delta, these funds are utilized for facilities outside of the Delta. However, an argument could be made that these funds should be assigned to the capital/O&M costs of a Delta levee restoration program.

2. A "Delta user fee" probably would be the most equitable way to obtain funds to offset the additional levee maintenance resulting from boat wakes, but an extremely difficult program to implement and operate. One reason for the difficulty, besides political, is that the courts have decreed that the waterways are open to the free use of the public.

3. Cal Boating probably would support a measure that would allocate General Funds towards offsetting the increased cost of levee maintenance resulting from boat wakes.

4. A portion of the gas tax could be allocated to Delta levee restoration.

State Highways

1. Because levee improvement to islands/tracts traversed by state highways would extend the life of the respective highway, an argument could be made that some of the foregone maintenance costs resulting from improved levees could be allocated to the cost of a Delta levee restoration program -- capital as well as operation and maintenance costs.

Implementation

1. Most reclamation districts have right of way easement/ownership for the existing levees. The local districts should be allowed to provide rights of way, without transfer of title, and be given credit for the market value of the lands. This would provide the lands at less than actual cost to project, and maximum credit against local allocated costs.

2. There is a need to develop alternatives for financing the local share of the costs. The "Way Bill" is one approach, a state loan program would be another.

3. AB 402 (Norm Waters) could be a vehicle to finance the non-federal portion of the project costs. In AB 402, it is planned to allocate funds proportional to benefits and to provide for reimbursement of the funds.

4. The cost of the Santa Ana project is about the same as the Delta Levees project. The status of the Corps study on Santa Ana is ahead of Delta Levees. It is planned that the nonfederal costs of the Santa Ana project will be financed by local property tax and a bond issue. It may be possible, and advantageous, to combine the projects under a single vote if a state bond election is needed for the nonfederal costs of the projects.

5. Establishing benefit assessment districts for the Delta should be considered.

6. Some project beneficiaries, East Bay Municipal Utility District for instance, may have the ability (as well as the desire) to contribute more towards the project costs but legally can participate only to the level of their respective allocations. A vehicle is needed to allow an increased level of participation.

7. We need to maintain the momentum to continue to upgrade the Delta Levees pending a major restoration project.

A "proportional net benefits" approach to cost allocation and funding depends heavily on how benefits are assigned to individual interests and how they are divided among the various affected parties. Criteria used to make these decisions play a pivotal role and need to be critically examined. Implementation problems also should be considered. For example, special adjustments or allowances may be needed to accommodate those who are unable to bear their "fair share." Mechanisms for collecting payments from private parties need to be designed and discussed, and methods for state and local financing should be developed.

Land Ownership

The questions of "who benefits" and "who pays" must also take into account patterns of land ownership in the Delta.

Many of the Delta landowners are absentee. Twelve islands are under single ownership, and many have only a few owners with large holdings. In addition, there appears to be substantial foreign ownership. According to the DWR report, almost 30,000 acres of Delta farmland were bought by foreign-based corporations during the 30 months before 1980. The purchase price for this acreage was approximately $48 million. Foreign purchases in the Delta are believed to have tapered off in 1981, possibly due to the recent levee failures and the impact on investors. (See Appendix C for detailed information on land ownership.)

Land Values

A DWR memorandum report entitled "Delta Islands Valuation Estimate," July 29, 1980, documents a cursory investigation of a real property valuation estimate involving 61 islands and tracts situated in the Delta. The investigation includes 4,793 parcels and approximately 271,921 acres of land and improvements which have an estimated acquisition cost of $1.6 billion.

If the four islands, Bethel, Byron, Hotchkiss, and Smith Levee, which have substantial residential and recreational use and thereby a relatively high valuation per acre are excluded, the 2,081 parcels primarily farmed had a per acre value of $2,300 in 1980. The average size of farmed parcel was 127 acres.

CONCLUSION

The Delta is one of the most intensively studied areas in California, if not the nation. The current Army Corps/DWR investigation is another in a lengthy list of studies that have been conducted over the years in the Delta by federal, state, and local agencies for flood control, navigation, water quality, recreation, and fish and wildlife purposes. The diverse nature of these studies is indicative of the conflicting interests in the Delta. Because of these conflicting interests, few proposals for Delta improvements have been implemented.

Should the levee system be rebuilt? One viewpoint is that rebuilding the levees will not solve the long-run problem because the islands will keep on subsiding. Furthermore, from agriculture's viewpoint, the economics are becoming questionable. Even today the cost of draining a flooded island may be more than the assessed value of the farmland. So one possibility is simply to let the most vulnerable islands go under. Those who oppose this view say that if one island goes, its neighbors will be threatened by wind and wave action. "If we don't protect all or at least most of the islands, we'll lose the entire Delta."

Existing legislative policy requires that the Delta be preserved in essentially its present condition. Whether that means all the islands is a disputed question. One suggestion is to create polders -- groups of islands protected by master levees -- with some of the more vulnerable areas excluded. This would be a relatively permanent, but expensive, solution.

Land subsidence means larger levees and, therefore, more costly protection per unit of productive land. In times of budget stress and advancing nonfarm priorities for public expenditures, the question is whether or not public agencies should continue to support and protect these levees.

During 1980, the state and federal government spent $1,850,000 for flood emergency funds, not including disaster reclamation fund claims of $31.8 million. With a full levee rehabilitation effort costing a billion dollars or more, hard questions must be asked as to the viability of rehabilitation plans.

If the Delta is to be saved, who should pay the bill? One viewpoint, held by state officials among others, is that the landowners in the delta are responsible for the condition of the levees, and cannot reasonably expect to be bailed out by the state. To that, Delta farmers respond that (1) over the long run, the cost of substantially rebuilding, or even effectively maintaining, the Delta levees is far beyond the capacity of local farmers, and (2) most Californians, south state water users and recreationists in particular, benefit from the Delta and ought to help pay. Furthermore, the big water projects and the boaters both contribute to levee damage.

This sounds like a deadlock, but may not be. DWR's stated position is that the state is not making any commitments to rebuild the levees right now, and in any case will not pay all the costs -- that local landowners must contribute substantially. Federal officials say more or less the same thing. The Delta farmers' chief point is that all beneficiaries should share the costs. To date, nobody has publicly proposed any cost-sharing formulas.

RECOMMENDATIONS

Proposed legislative action to address Delta levee problems is based on the following assumptions:

1) Federal money for levee rehabilitation work will be difficult, if not impossible, to obtain.

2) State funds will also be limited, especially if the proposed Peripheral Canal is constructed at a cost of nearly $1 billion.

3) Local governmental agencies do not have the capability to raise sufficient revenues for levee work.

4) The subsidence of tracts and islands will continue.

5) Levees will continue to fail.

6) Over time, as salt water intrudes into the area, the Delta will become an inland extension of San Francisco Bay.

Recommendations for Legislative Action

1) Create a Delta Task Force to examine various alternatives for raising revenues to repair and rehabilitate levees. (See Appendix D for draft legislation.) Duties of the body would include, but not be limited to, the following:

   a) Consider establishment of a Delta Preservation District with broad powers to raise revenues. Examine ABAG, BCDC, Tahoe, and other regional entities as models for the Delta.

b) Review Army Corps and DWR study reports when available in 1982.

c) Develop a 20-30 year rehabilitation program with priorities for expenditures.

d) Consider general principles for cost allocations (as outlined on pages 43-49) and develop an equitable cost-sharing formula for the levee rehabilitation project.

e) Report back to the Legislature within one year with recommendations.

2) Amend the Way Act to make more state matching money available.

3) Consider seed money for local efforts to start working on highest priority levees. State would ultimately match all money raised locally.

4) Reconsider Assembly Bill 402 (Norman Waters) for the purpose of placing a $250 million Delta Levee Bond Act on the November 1982 ballot.

5) Consider legislation to implement certain recommendations in the Delta Habitat Plan and to implement the "compatible and consistent" policies of the Delta Master Recreation Plan, the Delta Action Plan, and the Delta Waterways Use Program.

Creation of a Delta Task Force is the preferred course of action at this time. The other legislative actions can proceed independently and concurrently with the activities of the Task Force.

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6. "Sacramento-San Joaquin Delta Wildlife Habitat Protection and Restoration Plan." California Department of Fish and Game and U.S. Fish and Wildlife Service. December, 1980.

7. "Delta Master Recreation Plan." California State Resources Agency. September, 1976. (Draft)

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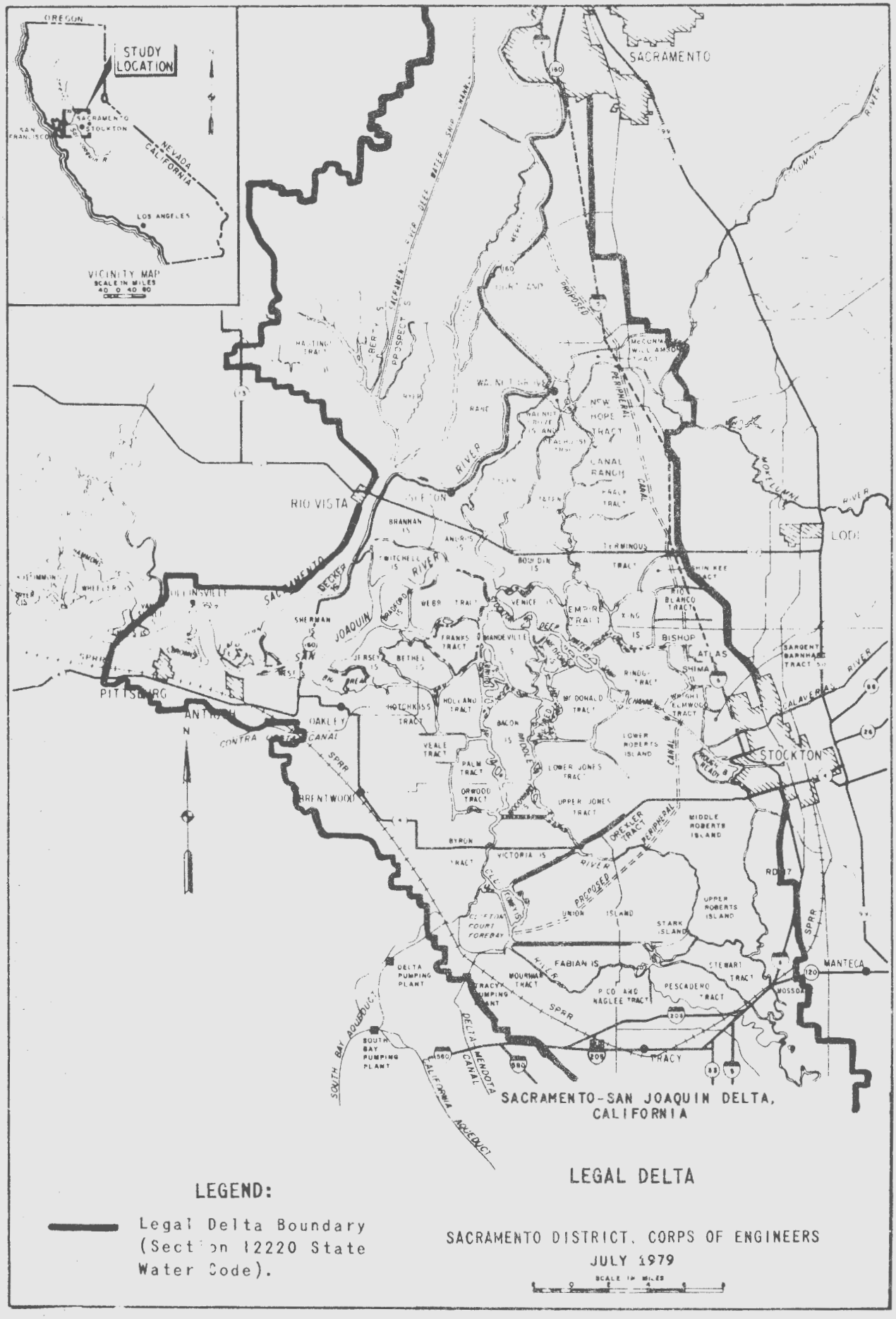
Figure 1


OREGON
STUDY LOCATION
SACRAMENTO
STOCKTON
SAN FRANCISCO
NEVADA
CALIFORNIA
LOS ANGELES
VICINITY MAP
SCALE IN MILES
40 0 40 80
SACRAMENTO
RIO VISTA
SACRAMENTO RIVER
SAN JOAQUIN RIVER
MOKELUMNE RIVER
CALAVERAS RIVER
PITTSBURG
ANTIOCH
OAKLEY
BRENTWOOD
CONTRA COSTA CANAL
STOCKTON
MANTECA
TRACY
LODI
PROPOSED PERIPHERAL CANAL
DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
SOUTH BAY AQUEDUCT
DELTA MENDOTA CANAL
CALIFORNIA AQUEDUCT
SPRR
SACRAMENTO-SAN JOAQUIN DELTA, CALIFORNIA
LEGAL DELTA
LEGEND:
Legal Delta Boundary (Section 12220 State Water Code).
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
JULY 1979
SCALE IN MILES

RELATIVE RESOURCE VALUES

Resource	Estimated Annual Value (million dollars)	Comments	Potential Impact From Levee Failure
Land (plus improvements)	$1,600 (acquisition cost)	DWR study of 57 islands and tracts, 4,800 parcels, 271,00 acres- land value (July 1980) = $783 million improvements = $310 million	Severe - Webb tract flood (Jan. 1980) - cost to reclaim island $14 million; appraised value $9 million.
Agriculture	$400 (gross)	$167 million direct income (net) +118 million indirect $285 x multiplier = $416 million total impact on gross state income.	Severe - 1980 flood claims - State (OES) $6.8 million Federal (FEMA) $25 million.
Natural Gas	$183	1979 natural gas production/ 1981 prices.	Severe (if production curtailed) - Replacement costs: Canadian Gas - $550 million Fuel Oil - $522 million.
Water Exports	$76	5.5 million acre-feet pumped from Delta. Fed CVP - 2.8 m.a.f. x $8.00 = $22 million; State SWP - 2.7 m.a.f. x $20.00 = $54 million. (no multiplier)	Great - Replacement costs: Groudwater pumping/high energy costs. Development of new supplies/transportation at higher costs.
Recreation	$75	1978 recreation expenditures (including fishing) at Delta marinas.	Moderate - Shifts in recreation type would occur.
Fisheries	$50+	Striped bass and salmon (no figures for steelhead, sturgeon, or shad). $15 million based on 1975 angler days + $34 million lost fish. Estimated potential 1980 angler demand in S.F. Bay/ Delta region = 19 million angler days valued at $30/ day.	Severe - If salinity regime changes in estuary the entire anadromous fishery could be lost.
Industry (2 paper mills)	$28	Combined payroll of 2 Antioch plants.	Moderate - Water quality important for other industries.
Shipping	$22	Port of Sacramento 1980 rev. = $9 million Port of Stockton 1980 rev. = $13 million	Slight - No impact from water quality. Siltation and navigation could be affected.
Oil	$0.5	1981 prices/1979 production	Minimal - Not a major resource in Delta. Flooding should not affect.

History of State Government Actions

1. The Delta Protection Act (Chapter 1766, Statutes of 1959) was enacted at the same session of the Legislature at which the Burns-Porter Act was adopted. The law prohibits diversion or export from Delta channels water to which Delta users are entitled. The legal Delta boundaries were also established in this measure.
2. In 1960, California voters approved the Burns-Porter Act to assist in the financing of the SWP. This Act includes Delta facilities "...for water conservation, water supply in the Delta, flood and salinity control, and related functions."
3. Following the Sherman and Mildred Islands flood in 1969, the Legislature adopted Senate Concurrent Resolution 151 requesting DWR to study problems relating to Delta levees.
4. In September 1973, DWR released a report, "Delta levees -- what is their future?" The report presented four alternative levee management programs: (1) No improvement, (2) extensive levee improvement, (3) moderate levee improvement, and (4) polders (master levee systems around groups of islands).
5. The Legislature enacted Chapter 717 in the 1973 Session (SB 541 - Way) which provided some financial assistance to local entities for levee maintenance. The "Way" Program also established state policy regarding the levee system.
6. In May 1975, DWR released Bulletin 192, "Plan for Improvement of the Delta Levees."

7. In 1976 the Legislature approved Bulletin 192 as the conceptual plan for a Delta levee system by passing the Nejedly-Mobley Delta Levees Act. This Act established policy to preserve the Delta levee system and called for a joint DWR/ Army Corps investigation. The law required interim study reports each year with a final report due January 15, 1980.

8. Chapter 1302, Statutes of 1976 (SB 1390) reestablished a program for state financial assistance to local agencies responsible for maintaining nonproject levees in the Delta. This bill was similar to SB 541 (Way Program) enacted in 1973.

   The purpose of this program was to stimulate interest in a levee maintenance and rehabilitation program at the local agency level by providing state financial assistance, $200,000 per year, to these local agencies. This financial assistance program has been effective in creating a higher order of interest in maintaining Delta levees. A working relationship has also been developed between Department of Water Resources personnel and Reclamation District engineers, who generally have maintenance responsibility over a number of Delta islands.

   Over the past three years, the $200,000 Way Program money has been cut from the state budget. At the urging of Senator John Garamendi, the 1981-82 Budget included $1.5 million for levee repair. The money can be used only on levees where local agencies are required to match state expenditures dollar for dollar.

9. In 1976, the Legislature passed AB 4193 (Chapter 970) directing DWR to conduct a subsidence study in the Delta.

10. In July 1978, DWR released Bulletin No. 76, "Delta Water Facilities."

11. Assembly Bill 402 (Norman Waters) was introduced early in the 1981 Session for the purpose of placing a $250 million Delta Levee Bond Act on the ballot. The measure failed passage in the Assembly.

LANDOWNERSHIP IN THE SACRAMENTO-SAN JOAQUIN DELTA

Scope of the Study

The study of landownership covers approximately 335,000 acres in the Sacramento-San Joaquin Delta. Boundary lines used to define the precise area under investigation closely coincide with the Delta lowlands as described in Delta Water Requirements, Appendix to Bulletin No. 76, February 1962, (DWR) (see Figure C-1). These lands are generally less than five feet elevation above mean sea level and consume water derived from Delta channels by subirrigation or surface application. The water surface of the lowlands has been assumed to include all water in channels affected by tidal action in the Delta and up to the lowest gauging stations on streams tributary to the Delta. Parts of five counties (Contra Costa, Sacramento, San Joaquin, Solano, and Yolo) were included. County acreage figures are given in Table 1.

Methodology

All parcels of at least 20 acres within the designated study area were identified using assessor's maps and the name of the owner as listed on the assessor's roll was recorded along with the acreage and parcel number. Using this information the total acreage and number of parcels owned was tabulated by county for each owner.

Results

Table 2 summarizes the number of acres, parcels, and property-owners of larger than 20 acre parcels in the study area. Table 4 identifies the name, total acreage, number of parcels, and location

of Delta landowners with at least 1,000 acres, while Table 5 gives the same information for Delta landowners with 500 to 999 acres in the study area. (A complete listing of landowners with more than 20 acres in the study area is not included in this report, but is available upon request.) The number of large owners listed in Tables 4 and 5 does not match exactly the number given in Table 2 because these summaries are still in the preliminary stages. Addresses and names need to be checked to see which owners can be combined.

Although minor adjustments are needed, several general observations can be made based on the existing information:

1) Landownership in Contra Costa, Sacramento, San Joaquin, and Solano Counties is heavily concentrated among the large landowners (i.e., those with at least 500 acres). In contrast, the vast majority of landowers in Yolo County fall into the 50-499 acre category.

2) Average parcel size tends to be larger in Contra Costa (213 acres), San Joaquin (237 acres), and Solano (232 acres) Counties, than in Sacramento (162 acres) or Yolo (105 acres) Counties.

3) The average number of parcels owned per owner is less than three in Solano (2.6) and Yolo (2.2) Counties and less than two in Contra Costa (1.6), Sacramento (1.8) and San Joaquin (1.9) Counties.

4) Large landowners are relatively "few" in number (about 160), but hold more than 60 percent of the acreage in the study area.

FIGURE C-1. Approximate Boundaries for the Delta Landownership Study

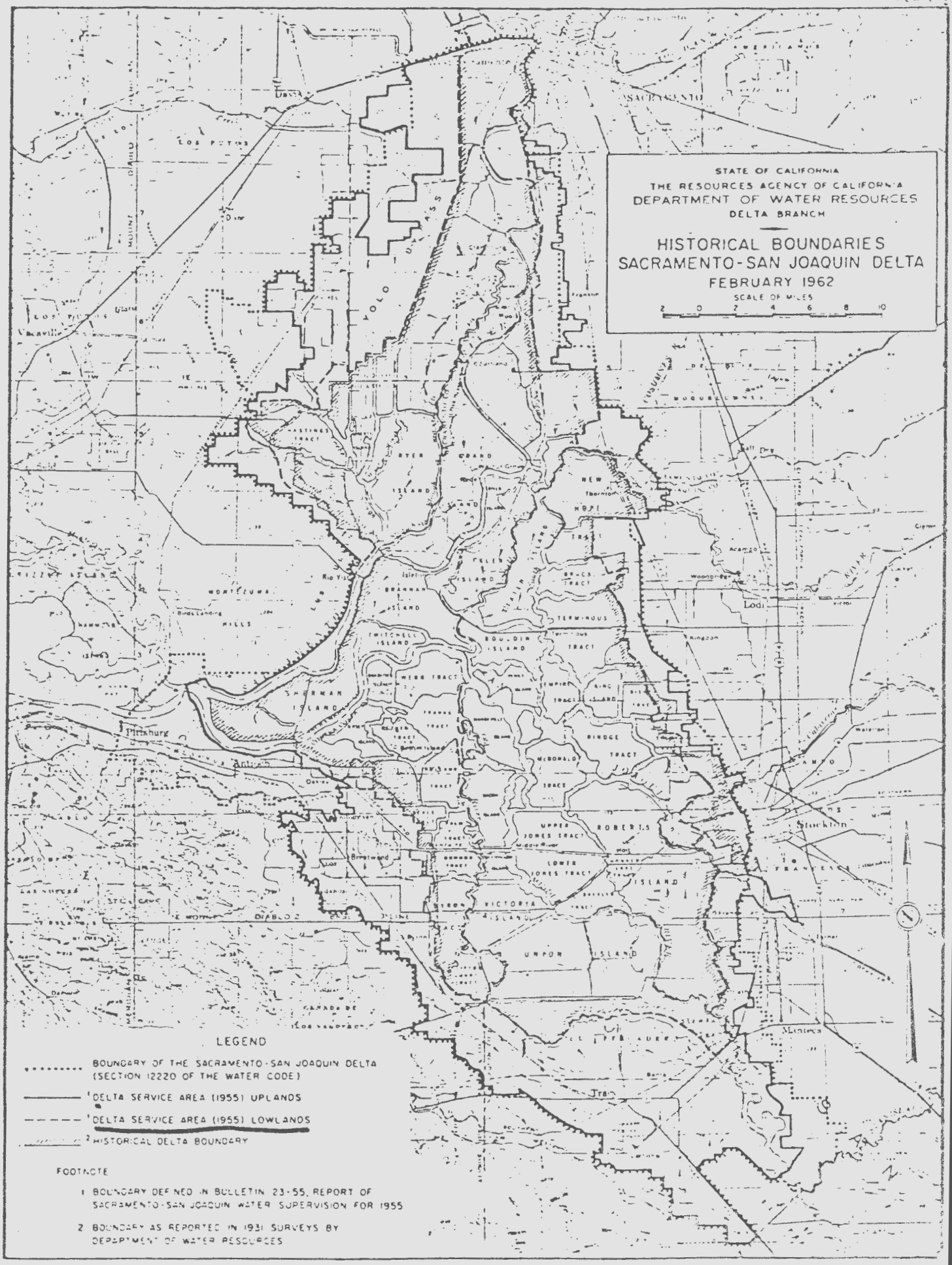


TABLE 1

ACREAGE BY COUNTY OF AREA INCLUDED IN THE
SACRAMENTO-SAN JOAQUIN DELTA LANDOWNERSHIP STUDY

COUNTY	TOTAL ACREAGE	PERCENT OF TOTAL
Contra Costa	38,120.8	11.4
Sacramento	91,142.5	27.2
San Joaquin	109,449.6	32.7
Solano	58,931.2	17.6
Yolo	37,333.2	11.1
TOTAL	334,977.3	100.0

TABLE 4

LANDOWNERS IN THE SACRAMENTO-SAN JOAQUIN DELTA

	TOTAL			CONTRA COSTA			SACRAMENTO			SAN JOAQUIN			SOLANO			YOLO		
ACREAGE CLASSES	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage
> 1,000	374	68	142,779.3	52	14	19,495	81	19	32,112	91	25	53,869	102	17	30,712.8	48	8	6,590.5
500 - 999	281	92	58,633	16	12	6,015.6	112	33	21,886.2	66	25	15,672.1	52	15	10,635.8	35	7	4,423.3
50 - 499	974	579	126,312.2	54	27	10,816.6	311	205	35,320.9	265	150	38,674.4	88	54	17,208.9	256	128	24,291.4
Sub Total	1,629	739	327,724.5	122	53	36,327.2	504	257	89,319.1	422	200	108,215.5	242	86	58,557.5	339	143	34,305.2
20 - 49	181	181	7,252.8	57	57	1,793.6	57	57	1,823.4	40	40	1,234.1	12	12	373.7	15	15	2,028
TOTAL	1,810	920	334,977.3	179	110	38,120.8	561	314	91,142.5	462	240	109,449.6	254	98	58,931.2	354	158	37,333.2

TABLE 3

LANDOWNERS IN THE SACRAMENTO-SAN JOAQUIN DELTA

PERCENT OF TOTAL

	TOTAL			CONTRA COSTA			SACRAMENTO			SAN JOAQUIN			SOLANO			YOLO		
ACREAGE CLASSES	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage	# Parcels	# Owners	Acreage
> 1,000	20.7	7.4	42.6	29.1	12.7	51.1	14.4	6.1	35.2	19.7	10.4	49.2	40.2	17.3	52.1	13.6	5.1	17.7
500 - 999	15.5	10	17.5	8.9	10.9	15.8	20	10.5	24	14.3	10.4	14.3	20.5	15.3	18	9.9	4.4	11.8
50 - 499	53.8	62.9	37.7	30.2	24.5	28.4	55.4	65.3	38.8	57.4	62.5	35.3	34.6	55.1	29.2	72.3	81	65.1
Sub Total	90	80.3	97.8	68.2	48.2	95.3	89.8	81.8	98	91.3	83.3	98.9	95.3	87.8	99.4	95.8	90.5	94.6
20 - 49	10	19.7	2.2	31.8	51.8	4.7	10.2	18.2	2.0	8.7	16.7	1.1	4.7	12.2	.6	4.2	9.5	5.4
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

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TABLE 4

DELTA LANDOWNERS WITH AT LEAST 1,000 ACRES[a]

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
1.	Arnando Bros., Inc.	1,133	CC	4
2.	Bank of California/trustee	1,067	SAC	2
3.	Bouldin Farming	2,923	SJ	4
4.	Cecchini & Cecchini/etal	1,122	CC	2
5.	Church, Emery E./etal	2,312	SOL	7
6.	Coleman Foley & C./ Foley Coleman & Co.	2,013	SJ	6
7.	Delta Properties Inc.	2,626	CC	7
8.	Deterding, Margaret Mary/actual	1,176	SOL & Y	6
9.	Douglas Morris Inc.	1,214	CC	1
10.	Ensher, A. Barsoom, Inc.	1,013	SJ	1
11.	Ensher, Alexandr & Barsoom, Inc.	1,591	SJ & Y	4
12.	Fildin Development Co.	1,558	SJ	1
13.	Floto, Irene/etal/c/o Wells Fargo	1,954	CC	4
14.	Fong, Henry L./etal	1,816	SAC	6
15.	Genuine Anstalt/etal c/o Eric Nielson Atty	1,506	CC	3
16.	Gladys Company, Inc.	1,971	SOL	1
17.	Golden Plow Ranch	1,362	CC & SJ	2
18.	Heringer Ranches Inc./actual	6,255	SAC & Y	28
19.	Island Farms	1,613	SJ	1
20.	Islands, Inc.	1,389	SOL	4
21.	Jonson, J. H./Sons, Inc.	1,055	SAC	7

[a] Names with less than 1,000 acres were included if they were throught to be closely related to another name and the combined total acreage of the two names was at least 1,000 acres.

TABLE 4 (Continued)

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
22.	Juve Investment Co. NV	2,798	CC	14
23.	Kelly, Helen E./Kelly, John C. Jr.	2,239	SJ	4
24.	Kirtlan, Robert L./Sr./Hazel A./etal	1,409	SAC & Y	12
25.	Klein Bud D./Trust/etal	1,980	SJ	13
26.	Knob Hill Mines Inc.	4,737	SOL	9
27.	Konxepta Corporation	1,203	SJ	1
28.	Kuhn, Alfred	1,850	SAC	8
29.	Leary, Dennis W.	1,266	SAC	8
30.	Lewis Nixon Co. Inc./ Nixon Lewis Inc.	1,200	SOL	7
31.	Lower Jones Co.	2,641	SJ	3
32.	Martel Company NV	2,477	SJ	2
33.	Martins, Pedro & Mary	599[a]	CC	1
34.	Pedro Martins & Sons, Inc.	426[a]	CC	1
35.	Mass, Joann M.	1,805	CC	5
36.	Mattot NV/Ubachi NV	1,066	SAC	1
37.	McCormack, Duncan	2,164	SAC, SJ, and SOL	7
38.	McCormack/Williamson Co.	1,260	SAC	2
39.	Moss, Ralph/etal	2,111	SOL	8
40.	M. & T. Inc.	9,054	SJ	1
41.	Narducci, Olinto	2,382	SJ	1
42.	New Discovery Inc.	1,001	CC	4
43.	Patterson, George R. & RE	2,976	SJ	14
44.	Payne, William C. & Payne, Wendell A.	2,122	SOL	9
45.	Peterson, H. E.	1,601	SOL	6

TABLE 4 (Continued)

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
46.	Prudential Insurance Co.	6,121	SOL	20
47.	River Investment Co. c/o Darsie W. P.	1,265	SOL	4
48.	River Island Land Co.	2,234	SAC	4
49.	Robinson, I. N. Jr./x I	2,081	SJ	13
50.	Rosemel Properties NV	1,407	SOL	4
51.	County of Sacramento	1,620	SAC	9
52.	Sacramento Bag MFG Co./etal	1,637	SAC, SOL, and Y	3
53.	Sacramento Yolo Port District c/o Shore M.	2,179	SAC, SOL, and Y	16
54.	Sakata Bros./Inc.	1,286	SOL	5
55.	Salyer, E. C./Nichols V.	3,765	SJ	1
56.	Silva, Conrad/etal	1,476	SJ	7
57.	South Real Estate Co.	5,267	SJ	1
58.	Speckman, George x A. G.	1,269	SJ	6
59.	The Texas Co.	1,252	SAC	4
60.	Upham, Charles E./Joseph E.	3,219	SAC	10
61.	USA	1,434	SJ & Y	3
62.	Volz, R. H.	1,156	SAC & Y	6
63.	Wallace & Norris Farms	1,021	SJ	2
64.	Welch Whiting	1,323	SJ	2
65.	Wells Fargo Bank/etal	1,363	SJ, SOL, and Y	4
66.	White, Ronald C.	1,123	CC	3
67.	Wilkinson, Owen E./etal	1,083	SAC	2
68.	Yee, Fong Yoeh	6,200	SAC	1

TABLE 5

DELTA LANDOWNERS WITH 500-999 ACRES[a]

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
1.	Andrus Realty	589	SAC	2
2.	Anstalt Genuine/etal c/o Eric A. Nelson	677	CC	2
3.	Avila, Edward W.	641	SAC & SJ	4
4.	Bloomfield, Harold J.	589	CC	1
5.	Blossom, RN	581	SJ	5
6.	Bohn, John/Bohn, Willard John Bohn/etal, Bohn, Willard	71 447	CC CC	1 1
7.	Bowlsbey, Glen A./etal	800	SOL	1
8.	Boyer, Ednora Shelley	870	SAC	1
9.	Brannan Realty NV	815	SAC	6
10.	Brodie, Jean Ann	583	SJ	3
11.	Burchell, Winifred B.	763	SAC & SJ	5
12.	Chevron USA, Inc.	918	SAC	2
13.	Coehlo, John	770	SOL	3
14.	Cortopassi, A./life est./etal Cortopassi, Amerigo/x T.	556 349	SJ SJ	2 1
15.	Darsie, Hutchinson/Pettigrew	596	SAC	4
16.	Dematei, Edward Jr./etal	616	SAC	5
17.	Diamond Properties	540	CC	2
18.	A Duda & Sons, Inc.	608	SJ	1
19.	Dwyer, R.C./Pg. Tr. & W. R. Jr./actual	988	Y	7
20.	Eberhardt, R. & M./etal Eberhardt, R. Trustee/etal	623 917	SJ SJ	1 1

[a]Names with less than 500 acres were included if they were thought to be closely related to another name and the combined total acreage of the two names was between 500 and 999 acres.

TABLE 5 (Continued)

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
21.	Eldon Land Co./etal	829	SJ	3
22.	Emigh, Richard M.	535	SOL	2
23.	Eppinger, Josua Jr./TR/etal	547	SAC	1
24.	Esperanza Enterprises	956	SAC & Y	9
25.	Fuhn, Sylvia/TR/etal	911	SOL & Y	4
26.	Ferreria, Mildred L./etal	541	SAC	3
27.	Fletcher Ryer Corp.	896	SOL	4
28.	Franklin, Jean T./etal	584	SAC	1
29.	Galli, Louise H./etal c/o Burnett, Burnett/etal	647	CC	1
30.	CD Goodwin Co.	732	SAC	2
31.	Graham, Russell G./etal	963	SAC	5
32.	Gridley, Arnold S. & Elsie N. c/o Gridley Realty	576	SOL	5
33.	Grunsky, Caroll G. Jr.	528	SJ	4
34.	Herzog Co.	644	SAC	5
35.	Holt, Ruth/etal/trst	754	SJ	4
36.	Huey Bros. Farm, Inc.	500*	SJ	1
37.	Jeffry, Bradford/etal	688	SJ	1
38.	Jensen, Josephine H.	643	SAC	2
39.	J. W. R., Inc./etal c/o Normellini & Grilli	97	CC	1
	J. W. R., Inc./etal c/o Michael Scriven	511	CC	1
40.	K. B. W. Ranch Inc.	555	SOL	2

*Approximate acreage.

TABLE 5 (Continued)

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
41.	Lee, Dayly/Jean/etal	893	SAC	5
42.	Lopes, Joe Sr./etal	847	SAC	4
43.	Loretz, Eric/Patricia	879	SAC	7
44.	Malu Farms NV	754	SAC	3
45.	Marumba NV c/o Coblentz WK	539	SJ	1
46.	Mazzanti, August/etal	596	CC & SJ	5
47.	McCormack, Wallace L./etal	625	SAC	2
48.	McDowell, Charles/Elaine	526	SAC	4
49.	McKeon Construction	508	SAC	4
50.	McKinnon, Irma/etal	594	SAC	4
51.	Mealer, Darell T./Bernice M.	614	SAC	6
52.	Mussi, Lory C. & Mussi, Rudy M.	624	SJ	8
53.	Ohm, Peter H.	534	SJ	4
54.	Olson, Jr., G.	715	Y	12
55.	Pacific Fruit Exchange	862	SAC	5
56.	Pacific Storage Co.	979	SJ	1
57.	Peirano, Ernest/etal	566	SJ	1
58.	Petersen, Chester/etal	984	SOL	2
59.	Podesta, Luigia/etal	597	SJ	1
60.	Prospect Farms/etal	875	SOL	7
61.	Radd Management Inc. c/o James K. Perry	644	CC	1
62.	Rawlings, Stuart L. Jr. c/o Keil & Connolly	880	CC	3

TABLE 5 (Continued)

	NAME ON ASSESSOR'S ROLE	TOTAL ACREAGE	COUNTY CODE	# OF PARCELS
63.	Sacto/San Joaquin Drainage Dist.	976	SAC & SOL	5
64.	Sanchez, Joe Farms Inc./etal	590	SAC	3
65.	Marion Sanchez Farms	773	SOL	3
66.	Schemiser, Alan	554	SOL	2
67.	Schropp, Werner & Irmgard	712	SOL	3
68.	S. J. Delta Farms Co. R. Jeffry	666	SJ	1
69.	Spaletta, John C. Jr.	548	SJ	2
70.	Stockton, City of	856	SOL	5
71.	Stockton Port District	528	SOL	9
72.	Strecker, Freida/life est.	564	SJ	2
73.	Texas Meat Brokerage Inc.	315	CC	1
	Texas Meat Brokerage Inc. c/o Dan Nomellini Atty.	647	CC	1
74.	Tooby Farms/A Calif. Ptnshp./actual	869	Y	3
75.	Tyler Island Farms	878	SAC	2
76.	Regents of Univ. of California	502	CC	1
77.	Whitney, Ruth B./etal	514	SAC	4
78.	Wilson, George C.	787	SAC & Y	5
79.	Wilson, George D. & Erma A./actual	511	Y	4
80.	Wilson/McCall Inc.	611	SAC	1
81.	Wurster, George/etal	790	SAC	4
82.	Wysuph, Leory Trust/etal	640	SJ	2
83.	Young, Donald Stuart	909.57	SJ	5
84.	Zacharias, Allen G. & Clara F./etal	676.4	SAC	3

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D R A F T

House Resolution No.

Relative to the Sacramento/San Joaquin Delta

WHEREAS, Heavy rains and high tides in the winter and spring of 1982 present a severe test to the Sacramento/San Joaquin Delta levees, some of which are over 100 years old and are in extremely poor condition; and

WHEREAS, Many of the Delta islands and tracts are subsiding and have flooded in the past due to weak levees, costing the state millions of dollars; and

WHEREAS, These Delta problems have been studied for many years by the U.S. Army Corps of Engineers and the State Department of Water Resources, yet levee restoration plans have never been implemented, funds have never been secured, and a cost sharing formula has never been proposed; and

WHEREAS, The Delta is a valuable resource that is crucial to the state's agriculture, oil and natural gas, water exports, recreation, fisheries, utilities and transportation, shipping, and industry; and

WHEREAS, The Assembly Office of Research report, Sacramento/San Joaquin Delta Dilemma, documents the value of the Delta resources, presents the many problems and issues which must be resolved, and recommends that an Emergency Delta Task Force be established; and

WHEREAS, The University of California has an organized interest in and expertise dealing with Delta problems; now, therefore, be it

Resolved by the Assembly of the State of California, That the Chairman of the Assembly Committee on Water, Parks, and Wildlife, in consultation with the Speaker of the Assembly, shall appoint an Emergency Delta Task Force to consist of the following nine members:

1) A representative of Delta reclamation districts
2) A representative of Delta water agencies
3) A representative of the Delta agriculture industry
4) A representative of the East Bay Municipal Utility District
5) A representative of Delta oil and gas interests
6) A person representing State Water Project contractors
7) A person representing utility and transportation interests
8) A public member representing Delta recreation and boating interests
9) A public member representing fish and wildlife interests; and be it further

Resolved, That the following six members, representing the counties located in the Delta, shall be appointed to the Task Force by the respective Board of Supervisors:

1) A member of the Alameda County Board of Supervisors
2) A member of the Contra Costa County Board of Supervisors
3) A member of the Sacramento County Board of Supervisors
4) A member of the San Joaquin County Board of Supervisors
5) A member of the Solano County Board of Supervisors
6) A member of the Yolo County Board of Supervisors; and be it further

Resolved, That the Emergency Task Force shall report to the Water, Parks, and Wildlife Committee as an advisory panel and shall perform the following duties:

1) Identify all beneficiaries of Delta resources, both local and statewide;

2) Develop an equitable cost sharing formula among beneficiaries for a levee restoration program;

3) Develop a mechanism for raising revenues at the local level;

4) Pursue the availability of funds at the state and federal levels; and

5) Review the U.S. Army Corps of Engineers and State Department of Water Resources reports, expected to be submitted in May 1982, and propose to the Subcommittee a preferred levee restoration plan; and be it further

Resolved, That the Water, Parks, and Wildlife Committee shall, in addition to the Emergency Task Force, draw upon the resources of other institutions, including, but not limited to the following:

1) University of California
2) Department of Water Resources
3) State Water Resources Control Board
4) Department of Fish and Game
5) Department of Boating and Waterways
6) Assembly Office of Research; and be it further

Resolved, That a sum not to exceed $10,000 be allocated from the Assembly Contingency Fund to the Water, Parks, and Wildlife Committee for the accomplishment of its purposes, such purposes to cover Task Force expenses and any University of California assistance; and be it further

Resolved, That the Emergency Task Force shall complete its specified duties and report to the Committee, with recommendations, by October 1, 1982.

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