

**BAY-DELTA OVERSIGHT  
COUNCIL**

**DRAFT**

**BRIEFING PAPER**

**IMPACT OF OUTDOOR RECREATION ON  
THE LEVEES AND NATURAL RESOURCES OF  
THE SACRAMENTO-SAN JOAQUIN DELTA**

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## BRIEFING PAPER

### IMPACT OF OUTDOOR RECREATION ON LEVEES AND NATURAL RESOURCES OF SACRAMENTO-SAN JOAQUIN DELTA

#### INTRODUCTION

The Delta's unique waterway system, which features 1,100 miles of shoreline, 50,000 acres of water surface and hundreds of islands, is a popular destination for outdoor recreation enthusiasts. With so much water, it is not surprising that boating and fishing are the most popular outdoor recreation activities.

Since the 1960s, environmentalists, local land owners and government agencies have expressed concern over the impact that outdoor recreation has had on the Delta's natural resources, primarily fish and wildlife, and its impact on the Delta's equally important agricultural businesses. Some of the more common complaints cite trespassing on private property, vandalism, fires, levee erosion caused by boat wake and loss of fish, wildlife, and riparian habitat.

Most of these impacts can be attributed to either the lack of public access to the Delta's existing waterways or the lack of public outdoor recreation lands and facilities. The need for improved outdoor recreation opportunities is well documented, and is generally not disputed. However, the need to protect and preserve the natural resources of the Delta is now required by state and federal laws, while the need to provide adequate recreation opportunities is not. Unfortunately, most efforts to provide more opportunities for popular recreational activities as boating, usually seem to have a negative impact on the Delta's endangered fish and wildlife and/or the Delta's agricultural businesses. A increase in boating would probably disturb wildlife and increase levee erosion.

This briefing paper presents a description of recreation in the Delta today. It also describes and discusses the impacts recreation has on the Delta's levees, lands and waterways, and it

identifies ways to balance the public's need for recreation with the public's desire to protect the Delta's natural and agricultural resources.

As part of this paper, a comprehensive literature search was completed which included the review of more than 30 government reports and studies on recreation in the Delta. These documents, which were prepared from 1961 through 1994 by public agencies of the state, county, and federal governments, provided much of the background data contained in this paper. The literature search did not always provide adequate information on some issues. Therefore, it was necessary to contact and interview knowledgeable individuals and employees associated with government agencies and local businesses, as well as private citizens. Their thoughts and opinions are also included in this paper. (For brevity, the word "recreation" will be used in lieu of the term "outdoor recreation" throughout the remainder of this paper.)

## SECTION I - CURRENT STATUS OF RECREATION IN THE DELTA AND OTHER MAJOR ISSUES

Water has always been a magnet which draws people to recreation areas. It is not surprising, therefore, that the Delta, with one of the largest waterway complexes in the western United States, is a popular regional recreation destination.

Another reason for the Delta's high level of recreational use is its close proximity to several large and expanding urban population centers, including Sacramento County to the north, the City of Stockton to the east, and the San Francisco East Bay communities to the south. The small but expanding Vacaville-Fairfield area lies to the west. In 1990, the five adjoining counties of Contra Costa, Solano, Yolo, Sacramento, and San Joaquin had a total population of 4 million people. This population is expected to increase to 5.2 million by the year 2005 (see Table 1).

The Delta's combination of open waterways, secluded, narrow, winding sloughs with overhanging riparian vegetation, convenient location and temperate climate all provide the public with a diverse assortment of recreation opportunities. Total recreational use has been estimated at 12 million recreation days per year.

### Present Recreation Uses.

Recreation in the Delta is primarily water-dependent and includes such diverse activities as powerboating, fishing, water skiing, sailing, jet skiing, house boating, swimming and non-motorized boating (canoes, kayaks, inflatables). Many of the recreation areas in the Delta are only accessible by boat, limiting their use by the general public. Some of the common activities which are not water-dependent include camping, picnicking, bird watching, nature study and sight-seeing.

Delta recreation is heavily dependent on private marinas, which provide boaters with access to the system of interconnecting waterways. Approximately 120 marinas operate in the Delta, providing approximately 12,700 berths, 46 restaurants, 47 boat launching facilities, 37 boat repair facilities and numerous boat rentals, campgrounds, and picnic areas.

Marinas are concentrated in a few locations, with Bethel Island having the largest number.

Public recreation areas and facilities in the Delta are very limited. Presently, there are only 22 public recreation facilities (see Table 2). Brannan Island State Recreation Area, with its excellent boat launching facility and expansive campgrounds, is the largest. Most public land in the Delta is managed primarily for protection of wildlife, which affords very limited recreational opportunities.

## WATER-BASED RECREATION ACTIVITIES

Boating. The Delta has been cited as one of the finest recreational boating areas of its kind on the west coast. Almost every type of recreational boating can be found here. It is not uncommon to find houseboats, sailboats, fishing boats, jet skis, speedboats, canoes, rowboats and inflatable boats all using Delta waterways.

About half of all recreation in the Delta involves boating. A 1986 study by the California Department of Boating and Waterways indicates that boating represents 56.5% of all Delta recreation. A more recent study by DWR pegged boating at 45% of all recreation in the north Delta.

Most boaters seem to prefer the central and northern parts of the Delta. Boating is a year-round activity, although it does decrease during the winter months.

It should be noted, however, that not all boating in the Delta is recreational. In 1933, large, ocean-going ships began to move through a deep water channel in the Delta to the port of Stockton. In 1963, another shipping channel to Sacramento was completed. Other commercial traffic includes tugs, barges, dredges, commercial fishing boats enroute to the Pacific Ocean and crawfish boats, but their numbers are few.

The more popular forms of water-dependent recreation are discussed below.

Houseboating. The Delta is well known for its houseboating opportunities. It is estimated that there are approximately 5,000 houseboats in use in the Delta (Business Journal-Sacto.). Houseboats typically range in size from 28 to 50 feet and sleep from four to 12 people. Several of the Delta's marinas rent houseboats to the general public. (No experience is required to rent a houseboat.) Houseboaters, like other boaters, tend to frequent the central and north Delta.

Sailing. Sailboats seem to be common in the Delta. However, one study indicated that sailing represents only 4.5% of all recreation use in the Delta. Sailors seem to prefer the open waters of the San Joaquin River and patronize marinas near 17 Mile Slough, Rio Vista and the City of Stockton. Sailing in the Delta can be challenging due to stiff winds, tides, low bridges and narrow channels (Spharler, pers. comm.).

Fishing from boats. Delta waters are home to a variety of fish: catfish, sturgeon, striped bass, largemouth (black) bass, American shad, salmon, crappie, bluegill and carp. Fishing from a boat represents 15% of all recreation use in the Delta. Fishing boats can be launched from Brannan Island State Recreation Area and several other public facilities. However, private marinas and small businesses provide most of the

facilities for boat fishing, including 47 launch ramps, 54 bait and tackle shops and 14 boat rental shops.

Anchoring. Some boaters come to the Delta for the primary purpose of anchoring in a quiet slough or other secluded spot for a few hours, a day, a week, or longer. There is no restriction on the length of time someone may anchor in the Delta, so some families live on their houseboats all summer (Spharler, pers. comm.). Delta Meadows is one of the more popular anchor locations for both the long and short term.

Jet skiing. Jet skiers like the Delta's close proximity and open waters. Private marinas provide the primary access to Delta waters. Little is known about the number of jet skiers who use the Delta, however, according to industry representatives, the sale of jet skis nationwide is expected to continue to increase significantly.

Water skiing. The Delta has been a popular destination for water skiing for generations. Water skiers, like jet skiers, appreciate the open, flat waters. However, the Delta's lack of suitable beaches is one drawback, (Gromm, pers. comm.). It is unknown how many water skiers use the Delta, but a 1981 DWR recreation study estimated the participation rate to be 15%, making it slightly more popular than photography (11%), and slightly less popular than swimming (23%).

Canoeing and Kayaking. Compared to other types of boating, paddle boating (canoeing and kayaking) is not very common in the Delta. It generally occurs in places and at times where fast powerboats or jet skis are not operating. The popular areas for paddle boats are the Cosumnes and Mokelumne rivers and Snodgrass and Seven Mile Sloughs. The busiest season for paddle boating is fall through spring (pers. comm., Griffith).

#### OTHER WATER-DEPENDENT RECREATION ACTIVITIES

Enjoyment of the Delta waterways does not always require a boat. Some of the popular non-boating, water-oriented activities are described below.

Swimming. This activity takes place in many locations, often in the calm, slow moving waters away from fast-moving boats. There are only a few public swimming beaches, one at Brannan Island State Recreation Area, and one at Sandy Beach in Rio Vista. An informal swimming beach is located at Cliff House (McElheney, pers. comm.).

Bank fishing. Bank fishing occurs at many places along the Delta's 1,100 miles of leveed shoreline. Since vehicular access is important to Delta visitors, including anglers, most bank fishing occurs on levees closest to improved roads. In addition to informal fishing off the levees, there are several public

fishing access points located at Georgiana Slough, the Cliff House, the Borrow Ponds and the City of Antioch's fishing pier .

Windsurfing. Windsurfing is a growing sport which was uncommon in the Delta ten years ago. The area along Highway 160 near Rio Vista is fast becoming a world-class windsurfing area. Volunteers have constructed the only formal windsurfing facility in the Delta at Brannan Island State Recreation Area .

#### LAND-BASED RECREATION ACTIVITIES

Not all recreation activities in the Delta are associated with water. The more popular land-based recreation activities are identified below.

Hunting. Waterfowl and pheasant are the most commonly hunted game. Hunting in the Delta occurs primarily on private agricultural lands during the fall and winter. Access is limited to the landowners and to members of private hunting clubs who are allowed to hunt for a fee. According to Department of Fish and Game staff, there are 33 hunting clubs in the Delta, comprising about 52,000 acres. Some clubs are also used for pheasant hunting. Some reclamation districts, working with the Department of Fish and Game, will also allow hunters to use private agricultural property within their district (Cordes, pers.comm.).

While most hunting occurs on private property, some hunting is allowed on these public lands: Franks Tract State Recreation Area, Lower Sherman Island, Twitchell Island, White Slough Wildlife Area and Manerville Tip.

Statistics on the number of recreationists who hunt in the Delta are not available, but it has been estimated that hunting represents only 3% of all recreation activity in the Delta.

Camping and Picnicking. Camping and picnicking are important elements of Delta recreation. One study estimates that 26% of all Delta recreationists camp overnight and 24% picnic. Many commercial marinas provide campgrounds, most with hookups for recreational vehicles. There are only a few public camping and picnicking facilities (see Table 1). Brannan Island State Recreation Area is the largest and perhaps the best known.

Hiking & Horseback riding. Horseback riding and hiking in the Delta are practically non-existent because of the lack of public land. Horseback riding is in high demand in neighboring Sacramento County, but currently the Delta cannot help to meet this demand because of the lack of public trails.

Bicycling. Lightly traveled, scenic roadways adjacent to Delta waterways presents a unique bicycling opportunity. However, riding a bicycle on the Delta's narrow and winding roads can be dangerous. Due to a lack of designated lanes and trails in the Delta, bicyclists must share the public roadways with high-speed traffic. For this reason, bicycling does not seem to be

encouraged by state and local government, nor by the private sector. Bicycling does not seem to be a very common activity, however, one study indicated that it represents 5% of all recreation activity in the Delta.

Bird Watching and Nature Study. The Delta provides habitat for 225 species of migratory and residential birds, and is therefore a destination for bird watchers and other nature study enthusiasts. The lack of public land and the limited road system significantly restrict public opportunities for studying and observing nature. Stone Lakes, Delta Meadows, and similar large natural areas may be well suited for "birding" and other wildlife study. However, even these passive form of recreation may be prohibited if the area is a sensitive wildlife habitat.

Driving for Pleasure (sight-seeing). A pleasant drive through the scenic and tranquil Delta region is the primary reason why some 37% of all recreationists visit. Use of the several intra-island car ferries can be a unique experience, as well as a visit to the historic town of Locke, or to Rio Vista or other quaint river communities.

Special Events. Several communities in and around the Delta sponsor special events to draw large crowds and bolster the local economy. The City of Isleton hosts the annual Crawdad Festival, while nearby Courtland promotes its Pear Fair each Summer. Stockton is the location for a number of large boating events throughout the year and Rio Vista sponsors a bass derby each fall. Walnut Grove hosts the Catfish Jubilee, while Bethel Island hosts a 50s Bash, an event dedicated to restored 1950s automobiles.

### ECONOMIC IMPACT

Recreation benefits the Delta's economy. Recreation and related support services are the third largest contributor to the Delta economy. Only agriculture and natural gas exploration are larger. Some of the services and supplies supported by recreation include boat docking and repair facilities, restaurants, grocery stores, equipment rentals and overnight accommodations (cabins, trailers, motels, and camp sites).

Current information on the economic impact of recreation on communities in and around the Delta is scarce. In 1960, it was estimated that recreation contributed \$75 million annually to the local economy. In 1982, the Assembly Office of Research estimated that it was \$73.6 million. (This amount was based on an estimated 11.9 million annual recreation days, and on an estimated expenditure of \$6.18 per recreation day). One 1988 study suggested that, with adequate recreation facilities, the \$73.6 million total would have been almost \$240 million (17).

The Department of Parks and Recreation is currently completing a survey of the expenditures of recreationists at Brannan Island SRA and the multiplier effect these expenditures

have on the local economy. The results of this report should be available by Fall 1994. The results of this study, should provide some factual information on the economic impact of recreation on the Delta.

#### CHANGES IN RECREATION ACTIVITIES OVER TIME

In general, recreation in the Delta seems to have changed little over the last 20 years. Based upon existing recreation studies, participation rates for the basic recreation activities such as boating, fishing, water skiing, houseboating and camping seemed to have remained relatively constant.

The demand for both fishing and ski boat rentals has dropped significantly. According to one source, recreationists now prefer to purchase their own boats instead of rent. The houseboat rental market has also declined in recent years. However, this decline is probably due to the state's weak economy and to a recent change in the federal tax policies which make houseboat rentals less profitable (Gromm, pers. comm.).

The two new recreation activities in the Delta, jet skiing and windsurfing, are both active water-oriented sports and both require specialized high-tech equipment. Although jet skiing is the newer of the two sports, it seems to be much more popular in the Delta. One industry source stated that the sale of jet skies increase 25-30% in 1994, which represents 25% of all powerboat sales (Plessner, pers. comm.).

Some Department of Fish and Game staff have noticed several recent changes in Delta recreation: a decrease in duck hunting (due to lack of suitable public land available for hunting) and an increase in bank fishing (Doody pers. comm.).

#### FUTURE TRENDS IN RECREATION

Envisioning future recreation trends in California based on current knowledge has always been difficult. Recreation planners in the late 1960s predicted that the four-day workweek was inevitable, and that an ever-expanding economy would open the flood-gates of demand for more and diverse recreation experiences. Recreation planners in the late 1970s were concerned that the shortage of oil from the Middle East would keep everyone recreating close to home. Now, in the 1990s, recreation planners are less optimistic. It will be a challenge to meet the recreational needs of Californian's continually diversifying culture with the continually shrinking recreation budgets of California's public recreation agencies.

Considering the problems with previous predictions, any assessment of future recreational trends in the Delta should be viewed with some measure of skepticism. Nevertheless, given an appropriate set of assumptions, a look at future recreation trends can be provided. The assumptions are as follows:

1. The economy of California will remain fairly stable for the foreseeable future.
2. The population of the five Delta counties will increase approximately 24% over the next 15 years.
3. The need to protect the Delta's fish and wildlife, and the need to preserve the Delta's agricultural businesses, will continue to take priority over the need to provide more recreation opportunities.
4. The need to provide water for agricultural and domestic purposes and for fish and wildlife will continue to take priority over providing more water-oriented recreation opportunities.
5. Tax revenues at the federal, state and local levels of government will remain in short supply.
6. The price and availability of gasoline will remain fairly stable.

Given these assumptions, the following recreational trends in the Delta are possible:

1. As population of the five Delta counties increases, so will recreation demand. The one undeniable contributor to increased recreation demand in the Delta is population growth in the surrounding areas. Between 1990 and 2005, the population in these counties will increase from 4 million to 5.2 million (24%).
2. Public recreation areas and facilities in the Delta needed to meet anticipated demand will not be provided. Therefore, existing and proposed regional water-oriented recreation areas and facilities in northern and central California will have to absorb this unmet demand.
3. Lack of public funds will force government agencies to continue to provide more revenue generating facilities and services at existing and proposed recreation areas. This will bring more public recreation areas and facilities in the Delta into direct competition with commercial marinas and other suppliers of private recreation.
4. Large boats, recreation vehicles and other expensive recreation investments will enjoy continued popularity, but the sales of these items will fluctuate with the economy.
5. The future availability of public funds to acquire and/or develop adequate lands and facilities in the Delta for active recreation is uncertain.

6. As more land is acquired to protect fish and wildlife, there will be an increase in opportunities for hunting, bank fishing, wildlife viewing, nature study and other passive recreational activities.

## FUTURE RECREATION OPPORTUNITIES

### Public recreation opportunities.

Existing public recreation areas and facilities in the Delta are insufficient to meet future recreation demand. Of the 56 potential recreation sites identified in DWR's 1981 Delta Outdoor Recreation Implementation Plan, very few have been developed. Considering the lack of funds available to public agencies, the prospect of providing adequate additional public recreation opportunities in the immediate future seems remote. There are a few potential projects, however, proposed by the Department of Water Resources, the Department of Parks and Recreation and the US. Fish and Wildlife Service. These projects are described below.

South Delta Program. Proposed enhanced recreational opportunities created by the South Delta Water Management Program would include: 1) channel improvements providing fishing piers, boat ramps and courtesy docks, 2) channel dredging providing better access for boaters to some scenic stretches of channel, 3) levee setbacks providing fishing access, parking and view points, and 4) barrier-type facilities which may improve recreation in shallow channels. This program is still in the planning stage.

North Delta Program. Various components of the this program would enhance recreational opportunities in the north Delta. Proposed channel improvements could provide the same types of additional recreational development as the South Delta Program above. This program is still in the planning stage, also.

Stone Lakes Wildlife Refuge. This proposed 18,000-acre wildlife area will be acquired by the US Fish and Wildlife Service, in cooperation with several state agencies and the County of Sacramento. Proposed development will be limited to facilities for viewing and interpreting wildlife. It is possible that bank fishing could be accommodated, but no facilities will be provided for boating or other active recreation activities.

Sherman Island. The Department of Water Resources is in the process of acquiring this 10,000-acre island as a protected wildlife habitat. To date, approximately 20% of the acquisition has been completed. It is a good location for providing some recreation opportunities because of its close

proximity to Brannan Island SRA and easy access to Contra Costa and San Joaquin Counties via State Highways 12 and 160.

Westgate Landing. The San Joaquin County Department of Parks and Recreation has considered the expansion of this existing facility to provide additional camp sites and berths. Due to a lack of funds, however, the County cannot proceed with this project.

Tower Park Public Launch Ramp. This site, located adjacent to the Tower Park Marina, has been identified by San Joaquin County Department of Parks and Recreation as a potential location for a new public boat launching facility. The county, however, does not have the funds to pursue this proposed project.

Twitchell Island. DWR has purchased more than 80% of this 3,600-acre island. Most of the land will remain in agriculture until it is converted to wildlife habitat. DWR intends to allow hunting on the island, and possibly bank fishing.

Delta Meadows. The Department of Parks and Recreation has purchased a portion of this project. Acquisition negotiations are continuing, but will not be completed anytime soon. Although the site is unimproved, except for a primitive boat launch ramp, it is a popular site for anchoring.

#### Private recreation opportunities.

Commercial marinas. Marinas with boat launching ramps, campgrounds and related support facilities provide most of the recreation opportunities in the Delta. The need for more marinas in the Delta is uncertain. There have been no studies of the need for more marina berths. A recent recreation plan prepared by the Delta Protection Commission indicated that, because of leasing and permitting difficulties, few marina owners expressed a desire to expand their facilities. In recent years, several proposals for new marinas have been submitted to government agencies for consideration, but few have actually been constructed. At the present time, a small marina in Walnut Grove is under construction and only one new marina, the Grand Harbor located in Sacramento County, has been permitted. Also, a 90-berth expansion of the Willow Berm Marina, also in Sacramento County, is under review (Simmons, Aramburu pers. comm.).

Delta Wetlands Project. This proposed project would convert two islands into two water storage reservoirs and two other islands into managed wetlands. DFG is currently negotiating with the project proponents, asking that a portion of the

project be open for public recreation including hunting, wildlife viewing, nature study and photography.

Hunting clubs. Most hunting in the Delta takes place on private agricultural lands and the popularity of these hunting clubs seem to be increasing. It is not known, however, if the number of clubs will increase. Based upon current literature, the need for additional hunting opportunities on private lands in the Delta is uncertain.

## RECREATION PLANNING TO DATE

Recreation planning in the Delta has been described as haphazard and uncoordinated. In California, local recreation planning, and all other land-use planning, is typically a county responsibility. Each of the five Delta counties has adopted a General Plan; however, there is little planning coordination amongst the counties, and each county addresses Delta recreation issues differently. Until recently, there has been no regional government agency responsible for the Delta; consequently, there has been no regional recreation plan. This situation may soon change. The Delta Protection Commission has recently completed a recreation and access study for the Delta. As a result of this study, policies adopted by the Commission could become part of a new Delta Regional Plan, which would then be used by the five Delta counties to guide future recreational and public access development.

In addition to the five counties, agencies of the state and federal governments have a great interest in the Delta, and exercise significant control over development in the Delta through the regulatory process. Due to different mandates and constituencies, however, many of these agencies are inherently in conflict with the counties, and with each other. As a result, recreation planning, even at the state and federal level, is not a successful, coordinated effort.

As of 1991, public agencies have allocated more than \$1 million to major reports on Delta recreation planning. The majority of these reports have been prepared by state agencies including the State Lands Commission, the Resources Agency, and the Departments of Fish and Game, Water Resources and Parks and Recreation.

Recreation Planning at the local Level. All 58 counties in California are required by state law to adopt a General Plan, including an open-space and/or recreation element which typically addresses the need for recreation. Although each of the Delta counties has adopted such a plan, each county's approach to planning varies. Sacramento County, for example, adopted its own unique Delta Community Plan in 1983. This plan identifies the recreational needs and uses in the Delta. It also identifies which areas along the waterways are suitable for active

recreation, and which should be set aside as natural areas. It endorses clustering of commercial recreation development to maintain the open nature of the Delta and prohibits night fishing.

Solano County's Delta planning efforts are contained in its 1983 Parks and Recreation Plan, which classifies the Sacramento River and the Delta as recreation resources. The plan cites problems created by unplanned and unregulated recreation use which have resulted in conflicts among users. It also cites conflicts among governing entities as the leading cause of uncoordinated efforts to implement recreation policies.

Although Yolo County's policies are more general, they do encourage the development of riverfront recreation, including fishing accesses, public walkways and waterfront parks.

Contra Costa County's plan has specific development criteria which also require marina projects to be clustered and located near similar uses. Also, commercial projects cannot conflict with adjacent agricultural uses.

The planning efforts of San Joaquin County include a 1992 recreation needs study and a General Plan which identifies 10 significant resource areas in the Delta, including Potato Slough, Disappointment Slough, South Spud Island, Middle River and Salmon Slough. Several routes through the Delta are designated as scenic roads by the county. Some limited commercial developments such as marinas are permitted in agriculture zones.

In 1985, the Delta Advisory Planning Council adopted a set of guidelines for the Delta. The council, which was formed by the five Delta counties, also proposed use of zones to minimize impact on wildlife habitat, use of speed zones to restrict boating activity in certain areas and development of a special signing program for recreation land and facilities in the Delta.

In addition to the five counties, many cities and communities in or near the Delta also have adopted General Plans with open-space and/or recreation elements.

Recreation Planning at the State Level. The Department of Water Resources' 1958 report, entitled: "Sacramento-San Joaquin Delta, Master Plan for Recreation", was one of the earliest plans for recreation in the Delta. Since then, many other documents have followed. A comprehensive list of these documents can be found on TABLE 2 (pg. 43).

#### CURRENT REGULATIONS

The Delta is regulated by a bewildering maze of local, state and federal agencies representing often conflicting, if not

competing, interests. With no state or regional provisions to resolve conflicts or inconsistencies between local, state or regional plans, there are no clear, consolidated state-wide policies to regulate the placement of recreation facilities or control recreation activities in the Delta.

Currently, the following state agencies have a role in reviewing or approving the acquisition, development and/or operation of recreation areas and facilities:

#### LOCAL AGENCIES

The Delta counties regulate land use through their general and specific plans and their zoning ordinances. Recreational developments usually require a use permit and/or building permit from the county.

In addition, law enforcement in the Delta is primarily the responsibility of the affected county sheriff. All of the five Delta county sheriffs operate their own boat patrol program.

#### STATE AGENCIES

##### Department of Boating and Waterways (DBW)

DBW provides grant funds for boating safety and education, local waterway law enforcement, public access boating facilities, and water hyacinth control. It also licenses yacht and ship brokers. To fund its programs, DBW receives money from boat fuel taxes, boat registration fees and interest from loans and surplus money investments. It is responsible for adopting state boating regulations and for maintaining uniformity between federal and state boating laws. Between 1990 and 1992, DBW spent over \$75 million on these activities.

##### Department of Water Resources (DWR)

DWR manages the transport of water and construction of water facilities in the Delta associated with the State Water Project (SWP), which includes the Clifton Court Forebay Storage and Pumping Facility in the south Delta, the Suisun Marsh Salinity Control Structure and the North-Bay Aqueduct Intake in Barker Slough. DWR is required by the Davis-Dolwig Act to plan for recreation facilities as part of the SWP.

##### State Reclamation Board

This board issues permits to maintain the integrity and safety of flood control project levees and floodways in the Central Valley, including the Sacramento and San Joaquin Rivers and their tributaries. Any activity that encroaches on project levees and floodways within the Delta, such as marinas, requires

a permit. "Project levees", which are part of the Sacramento-San Joaquin River Flood Control Project and the San Joaquin River Flood Control Project, comprise about 35% of the Delta levee system.

#### Department of Fish and Game (DFG)

DFG is the principal agency charged with protection of the state's fish and wildlife resources. It regulates hunting and fishing and carries out the state's native plant and fish/wildlife protection laws, as well as the state's Endangered Species Act. In addition, DFG has permit authority over certain recreation activities such as hunting at Lower Sherman Island and White Slough Wildlife Area, and permit authority over the development of any recreation improvements such as marinas, fishing access's or boat launching facilities, which will divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposes to use any material from a streambed.

#### State Water Resources Control Board/Regional Water Quality Control Boards

These boards regulate surface water diversions and set/enforce water quality standards for the Delta and other waters of the state. Delta recreational activities are generally not directly affected by the actions of these agencies. Dredging for a marina, however, could require a permit from one of the two Regional Water Quality Control Boards whose regions include the Delta (San Francisco Bay Region or Central Valley Region).

#### State Lands Commission (SLC)

The SLC may lease or otherwise manage the use of sovereign tidelands, submerged lands and beds of navigable waterways under its jurisdiction. Most of the Delta waterways are within the SLC's jurisdiction. Examples of recreational uses which may require the use of sovereign lands are marinas, docks, piers, water skiing facilities, boat houses, boat launching ramps and floats.

#### Bureau of Reclamation

The Bureau of Reclamation operates the Central Valley Project which includes Folsom Dam, the Delta Cross Channel and the pumping plant at Tracy. It does not provide recreation facilities in the Delta.

#### Department of Motor Vehicles (DMV)

The DMV provides boat registration services under contract with the Department of Boating and Waterways.

#### Department of Parks and Recreation (DPR)

DPR operates three units in the Delta: Brannan Island and Frank's Tract State Recreation Areas and Delta Meadows. Brannan Island provides a camp area, a picnic area, a small interpretative center and a large boat launching facility. Frank's Tract is accessible only by boat and provides minimal facilities. Delta Meadows is unimproved except for a gravel access road and a primitive boat launch ramp.

#### FEDERAL AGENCIES

##### US Fish and Wildlife Service (FWS)

The FWS administers federal fish and wildlife protection laws, including migratory birds, anadromous fish and endangered species. While not a permitting agency, the FWS consults with other federal, state and local agencies on issues of fish and wildlife protection. With regard to federally-listed threatened and endangered species, the FWS generally has the authority to prevent the taking of such species by public or private entities. The listing of the Delta smelt by the Department of the Interior and the winter-run Chinook salmon by the Department of Commerce has had a significant effect on operation of the state and federal water projects using the Delta for water transfer.

##### US Army Corps of Engineers (USCOE)

A USCOE permit is needed to locate a structure, excavate or discharge dredged or fill materials into waters and wetlands of the United States or to place a structure that obstructs or affects navigable waterways. Much of the Delta's land and water falls under the USCOE permitting jurisdiction. The construction of a boat ramp or fishing pier, for example, may require a USCOE permit, as would dredging for channel and levee maintenance, placement of rip-rap and other activities.

##### US Coast Guard

The Coast Guard patrols the Delta to enforce federal boating regulations. The Guard has the authority to stop boats and to cite operators for reckless driving, intoxication, drug possession, and for non-compliance with federal boat safety standards. The Guard maintains cooperative law enforcement agreements with the sheriffs departments of the Delta counties. The Guard maintains a boat at Rio Vista for 24-hour search and rescue work and it provides and maintains lights, buoys and other aids to navigation in the Delta, and regulates drawbridges for

vessel traffic. It is also responsible for assisting in the prevention and cleanup of pollutant spills in navigable waters.

Environmental Protection Agency (EPA)

The EPA is responsible for setting water quality standards under the Clean Water Act and air quality standards under the Clean Air Act. In California, enforcement is delegated to the Regional Water Quality Control boards. The counties enforce water quality protection laws as they apply to local water needs. The Air Resources Boards and the regional Air Pollution Control/Air Quality Management districts develop regulations and enforce the air quality laws.

With air quality, however, the EPA has taken a more direct role. Under court order, the EPA has prepared and is circulating a draft Federal Implementation Plan for air quality in an area that includes that portion of the Delta which lies in Sacramento County. The draft plan proposes that boats sold beginning in 1998 have 60% lower exhaust emissions and proposes that a permit/fee system be established to encourage the purchase of newer, less polluting boats.

## SECTION II. MAJOR RECREATION ISSUES

### IMPACT OF RECREATION ON LEVEES

Levee Inspection Efforts. Commercial boat marinas located adjacent to levees are often cited as impediments to the visual inspection of levees for leaks and other weaknesses. Levee inspectors contacted for the purposes of preparing this briefing paper, however, indicated that marinas are not a problem for them. Many of the marina improvements are located on the waterside of the levee, thereby obscuring only that small portion of the levee between the water line and the top of the levee. Also, marinas occupy a very small area when compared to the entire 1,100 miles of leveed shoreline. Anglers parking in front of levee access gates is a problem according to one levee inspector. When these vehicles block access to the levee service road, the inspectors cannot do their job in a timely manner (Burns, Yoman, Mayers, pers. comm.).

Flood Fighting Efforts. During major floods, boats and other floating debris from marinas may break free and block bridge openings, exacerbating flood danger. Marina structures and facilities are also cited as impediments to fighting floods. However, there seems to be little evidence to justify this concern. Distinguishing between leaks in the levee and leaks caused by broken water and sewer lines can be a problem, especially when the owner of the marina is not sure of the location of these utility lines. However, marina owners are often the first ones to notice and report a levee leak to an inspector (Yoman, pers. comm.).

Levee Maintenance Efforts and Costs. It is commonly thought that levees near marinas are more time consuming and expensive to maintain. However, this is usually because marinas receive more public scrutiny, and the owners may require a higher standard of levee maintenance (Yoman pers. comm.).

Erosion Due to Boat Wake. Levee erosion caused by the wake of passing powerboats is one of recreation's biggest impacts upon the Delta. Because of this erosion, boats are cited as sources for both the decline in wildlife habitat and an increase in levee maintenance costs. In 1971, in response to these concerns, the Department of Boating and Waterways (DBW) hired a private consultant to study this problem. In 1975, the Department of Water Resources (DWR) released a similar study, also prepared by a consultant.

The DBW study acknowledged that there are many causes of levee erosion, and it would be very difficult to establish what percentage of erosion may be caused by the various erosive forces

at work. Among the forces cited were flood flows, tidal flows, wind-induced waves, ship-induced waves, seepage forces, rodent burrows, vegetation, wind erosion, traffic and others.

The study concluded that approximately 20% of the annual energy dissipated against the levees could be attributed to boat-generated waves.

According to the study, the tendency to blame boaters for a disproportionate share of levee damage may be partly psychological. When boats and people are in the Delta, the weather is likely to be good (no high winds and/or heavy rainfall) and the channels will not be in a flood stage. Under such conditions, the boats present the most visual source of erosive energy.

DWR's 1975 study analyzed two typical channels in the Delta to determine the relative amount of levee erosion caused by both natural forces and boat-wake. This study showed that "in a typical narrow channel, subject to winter floodflows and heavy boat traffic, about 20 percent of the annual energy dissipated against the levees could be attributed to boat-generated waves, about 10 percent to wind-generated waves, and 70 percent to tractive shear stress." "In a channel relatively unaffected by winter floodflows, energy dissipation from boat-generated waves was shown to range from about 45 to 80 percent of the total, depending upon wind-movement assumptions made in the computations."

Although the findings of both studies were inconclusive, and both studies recommended that further study is needed, it can be concluded that boats are a highly visible source of levee erosion, but that other sources of erosion are probably just as significant.

Disturbance to Levee Slope Protection. Recreationists, especially anglers who drive or walk on unprotected levees, can disturb the soil and accelerate slope erosion. Also, anglers sometimes damage levees by removing the protective layer of rock known as rip-rap. Some of the reclamation districts contacted complained about the time and expense required to replace the rip-rap materials. Once the rocks are removed from the levee slope, they are either placed on top of the levee to form campfire rings or to construct small wind shelters, or they are rolled into the water to create personal fishing platforms. The layer of rip-rap is typically only 18" thick, so the removal of only a small section of rock will expose the fragile levee soil to wave erosion. This is a special problem with the vast majority of levees which were constructed without a filter material under the rock which is now used to help keep soils in place (Hardesty, Yoman, & Mayer, pers. comm.).

## IMPACT OF RECREATION ON DELTA WATERWAYS

Reduced Public Access to Waterways. Development of recreation facilities such as marinas, yacht clubs and duck clubs can restrict the public's access to Delta waterways. The Department of Fish and Game has received complaints about some duck club employees who try to keep hunters out of sloughs which are public waterways. It has been alleged that some club employees have told hunters to leave, even if the hunters are on public land or public water. Some DFG employees are also concerned about the impact construction of more marinas will have upon public access. They have recently reviewed applications for several new marinas and a boat sales facility. If the sales facility is constructed, it will occupy the last open area on Lower Andrus Island (Doody, pers. comm.).

The use of leveed shoreline for marinas and other commercial recreation facilities can also block the public's access to public waterways. However, the few miles of leveed shoreline used for marinas is very small when compared to the hundreds of miles of shoreline used to protect agriculture lands. However, inasmuch as 90% of the land in the Delta is private, any loss of public access must be considered important.

In addition to structures on the shore, structures in the Delta waterways can also be an impediment to public use. In 1981, the U.S. Army Corps of Engineers identified approximately 200 known illegal structures in the water, including private slalom courses, ski jumps and docks.

Boat Safety as an Impact on Delta Waterways. For many years, some Delta user-groups have expressed concern over the seemingly high number of boating accidents in the Delta, citing the use of alcohol, operator inexperience or ignorance and excessive speed as probable causes. Other problem areas mentioned were concentrated boating activity near blind bends, excessive boat wakes, dangerous intersections, narrow channels and conflicts between various types of boating activities.

In 1984, this concern prompted the State Legislature to require the California Department of Boating and Waterways (DBW) to conduct a study of boating safety in the Delta. The resulting study concluded that the boating accident rate for the Delta was not significantly higher than the rest of the state. The study also indicated that of all boating accidents reported in California, about 10% occurred in the Delta. According to DWB staff, the rate for reported boating accidents in the Delta continues to average about 10% of the statewide total (Johnson, pers. comm.). Therefore, it can be concluded that the accident rate for the Delta continues to be about average when compared to the rest of the state.

As part of this study, Delta law enforcement agencies were surveyed to determine the causes of boating accidents in the

Delta. These agencies indicated that the following factors were major safety problems: 1) lack of boater knowledge or training; 2) speed and wakes in both posted and unposted areas, as well as a lack of uniformity in regulatory signs; 3) operation of vessels while under the influence of alcohol and/or drugs; 4) obscured visibility due to intersecting waterways or riparian vegetation; and 5) water skiing and operating "thrill craft" in congested or narrow waterways.

Also included in the study was DBW's analysis of boating accident reports from 1981-85. Of the boaters who reported accidents, at the time of the accidents, 36% were cruising, 18.6% were water skiing, and 13% were just maneuvering their boat. It should be pointed out, however, that this 1985 study was completed prior to the rapid increase in use of personal watercraft (jet skis). In 1993, personal watercraft accounted for 41% of all boating accidents which resulted in injury (Johnson, pers. comm.).

Houseboating on the Delta seems to be a very safe activity. In 1991, there were only 13 reported houseboating accidents and property damage amounted to less than \$22,000. The main problem with houseboats seems to be their high profile, which creates a "sail area" that can make them hard to manage in high winds and make docking a real challenge (Business Journal-Sacramento).

As a result of the study, DBW recommended that the following actions be taken to improve boating safety in the Delta: 1) state and local agencies should do more to emphasize boating safety education and enforcement; 2) all buoys, waterway markers, information signs and control zones should be uniformly marked, 3) state and local agencies should do more to inform the boating public of safety problems unique to the Delta, such as merging channels and blind intersections, and, 4) require every person who is convicted of a boating violation to pay a fine or complete a boating safety education course.

Conflicting Water Activities as an Impact on Delta Waterways. Recreational use of the Delta's waterways is essentially unplanned and unregulated. As a consequence, there are many conflicts between various recreational uses on the Delta waterways. For example, jet skiers, anglers and swimmers in close proximity cannot help but encroach on each other's activity.

Conflicts are more likely to occur when active uses such as water skiing and boat cruising occur in narrow or heavily used channels. Conflicts do occur, however, even when sufficient water surface area is available. The result of these conflicts can range from a recreation experience spoiled to property damage or even serious injury. Another problem can be displacement of passive recreation by active recreation. Typically, active recreation involving fast and/or noisy watercraft will drive away or displace more passive forms of recreation such as fishing and wildlife viewing.

## IMPACT OF RECREATION ON PUBLIC AND PRIVATE LANDS

Encroachment on Public Lands. Since 90% of the land and most of the shoreline is privately owned, any loss of the remaining public land is significant. Unfortunately, some of the higher non-leveed channel islands are occupied by squatters and public use is effectively precluded. Although the ownership of many of these islands is contested by the state, as soon as a squatter claims ownership the land is often occupied and public use discouraged.

Trespassing on Private Property. With so much of the Delta in private ownership, it is not surprising that incidents of trespass are common. Most boats are launched from private marinas, however, once away from the launch area, there are few places to anchor a boat and go ashore without trespassing on private property.

Bank anglers also frequently trespass on private property. Except for a few designated fishing areas, most access to the 1,100 miles of shore line is privately owned.

There are also complaints of recreationists trespassing on agricultural lands. These property owners also complain of noise and loss of privacy.

Vandalism. Some reclamation districts are hit hard by vandalism. One such district complained that vandals will shoot-up signs, tear down fences (wooden fences are used for firewood), damage outbuildings (shoot out windows and strip off wood for campfires), remove rip-rap from levees and break into water stage recording stations (Hardesty, pers. comm.).

Fires. In one reclamation district, it is estimated that about 10% of the wildfires originate from unattended campfires. Many of the fires originate along public roads, where some are caused by careless motorists, while others are intentionally set (Hardesty, pers. comm.). The Delta's rich peat soil can be highly flammable, and once a fire is established, the flame is practically invisible, making it very difficult to locate and extinguish. Crops which are left to dry in the field, such as wheat and hay, can also become a source of highly combustible fuel for fire (Aramburu, pers. comm.).

Off-Road Vehicles. Damage to public and private lands by off-road vehicles can be an occasional problem. According to the Department of Fish and Game, these vehicles are used by some hunters and occasionally damage agricultural land (Doody, pers. comm.). Representatives of reclamation districts, however, did not consider off-road vehicles a serious problem (Hardesty, Mayer, and Yoman, pers. comm.).

Increased Maintenance Costs. Property owners responsible for maintaining the Delta's levee system complain about having to pay for the erosion damage caused by boat-wake. Damage caused by a trespasser's carelessness or vandalism is an additional expense for the property owner. One reclamation district, complaining of increased maintenance costs, cited the need to hire additional security patrol just to help reduce vandalism (Hardesty, pers. comm.).

Litter and Trash. Litter and trash is a common problem in the Delta. Boaters are often singled out because the restricted space on most boats can make it tempting to "overboard" trash. Many anglers and picnickers do not practice the "pack it in, pack it out" ethic and add to the litter problem. Because so much recreation occurs illegally on private property, it is difficult to locate trash collection facilities where they are needed. The few public recreation facilities are so far apart, and public agencies have such limited maintenance staff and equipment, that trash collection is often inadequate. One local business representative complained: "There's a lot of places where you can just informally go out and fish off the bank...unfortunately, most of those places end up like garbage pits". It should be noted, however, local residents dumping household garbage may be responsible for some, if not most, of the trash dumped in the Delta.

#### IMPACT OF RECREATION ON FISH, WILDLIFE AND RIPARIAN HABITAT

The Delta's enduring attraction for recreation purposes is closely linked to protection and management of both fish and wildlife. The riparian habitat is also important, not only providing the aesthetic quality which so many recreationists find desirable, but also sustaining the fish and wildlife which are an essential part of the Delta recreation experience.

#### IMPACT ON FISH

The general decline of the Delta smelt and winter-run Chinook salmon has resulted in both species being listed under the federal and state Endangered Species Acts. These, and other Delta fish, are affected by a number of problems, including a reduction of water flowing into the Delta, exports of water from the Delta, changes to the food chain due to introduction of non-native aquatic species, water quality and legal and illegal harvest.

The reasons for the decline of certain Delta fish population are not thoroughly understood by biologists. However, recreation facilities which may contribute to water pollution, and recreation activities involving illegal taking of game fish, are probably minor contributing factors. (A detailed analysis of the

impact of legal and illegal catches on Delta fish is the subject of a pending BDOC briefing paper.)

Water Pollution. Water quality problems are often cited as one reason for the decline in the fish and wildlife population. Marinas and recreation boaters are partly to blame. Boats in California are required to have proper sewage disposal equipment; however, few marinas are equipped with sewage pump out facilities, or use proper handling methods. Sewage is often disposed of directly into the Delta, an action that is illegal but not effectively enforced. Contact with DFG indicated that sewage discharge into the Delta is common and many complaints are received (Doody, pers. comm.).

Fueling accidents, leaky tanks and lines and carelessness allow spilled oil, diesel and gasoline into Delta waters. Paint and toxic anti-fouling chemicals contaminate many marinas and spread into the Delta, often in significant concentrations. California has prohibited use of anti-fouling paint since 1988 (Title 3 CCR 6488).

However, it is recognized that water quality problems may also be caused by salinity intrusion, reverse flows, dredging and toxicity. It was suggested that untreated sewage in the Delta waters may be more of a health threat to the people who swim in it than it is to the fish who live in it (Doody, pers. comm.).

Illegal Fishing and Hunting. Fishing, both legal and illegal, can affect and threaten the Delta's biological resources. It is estimated that poachers take about 500,000 striped bass out of the Delta each year. However, this number is significantly less than the annual number of fish killed by the Delta's CVP and SWP water pumping facilities. Still, illegal fishing is a concern because it removes older fish, fish with a greater chance of surviving to spawn (Stockton Record). As previously mentioned, this subject will be discussed in more detail in a future briefing paper.

Illegal hunting also occurs in the Delta, but the number of reported incidents are few and the consequences are probably insignificant (Dooley, pers. comm.).

#### IMPACT ON WILDLIFE

Some Delta recreation activities, such as hunting, bird watching and nature studies, are directly dependent on the quantity and quality of wildlife. The Delta is a critical link along the Pacific Flyway for wintering and nesting migratory waterfowl, as well as resident birds and mammals. Unfortunately, illegal hunting or recreational activities which produce noise and litter are partly responsible for damage to some wildlife.

Human Noise and Activity. There seems to be little information available regarding the impact of human noise and activity on wildlife. It appears that Delta wildlife may be fairly adaptable to human activity; however, there is no evidence that the long-term impact is without consequence. One recent study of wetlands in the SF Bay Area indicated that: "it appears that birds in wetlands with high levels of human activity have become acclimated to this disturbance...however, and most importantly, areas of high human use had substantially lower overall bird use than areas of infrequent human use".

In another study, it was noted that, in addition to reducing levee erosion, one added benefit of "no wake" zones is the reduction of the impact of boat noise on wildlife.

Litter. Litter can be injurious or even deadly to wildlife if it is mistaken for food, or if birds or mammals become entangled in it. Litter is a chronic problem according to the Department of Fish and Game and offenders are hard to catch (Doody, pers. comm.).

Illegal Hunting. Hunting in the Delta is carefully regulated to prevent serious threats to overall population survival, therefore, illegal hunting does not seem to be a serious problem. Almost all hunting of waterfowl occurs on private agricultural lands and the property owners do an effective job of preventing unauthorized taking of game birds on their property (Doody, pers. comm.).

#### IMPACT ON RIPARIAN HABITAT

The popularity of the Delta for recreation is dependent on protection of riparian habitat. This vegetation not only confers on the Delta its characteristic aesthetic quality, it also sustains fish and wildlife. In addition, it provides shelter to boaters and other recreationists.

The loss of natural habitat for wildlife is a serious concern to wildlife biologists. According to the Department of Fish and Game's Delta Wildlife Habitat Protection and Restoration Plan: "Uncontrolled intensive recreational use presents the most serious threat to the habitat values of channel islands, through both disturbance to wildlife activity and modification of habitat conditions by vegetation removal and wave erosion of islands from excessive boat wake".

This DFG report attributes the loss of habitat to the following causes: 1) development of marinas; 2) encroachment of minor structures into waterways and shorelines; 3) conversion of wetland habitat to open water marina basins; 4) damage to marsh and riparian vegetation by boaters' recreational use of islands,

and 5) levee-eroding waves from boats, which necessitate replacement of vegetation with rip-rap.

The Delta Recreation Master Plan (1976) identifies other adverse environmental effects of recreation on habitats: 1) trampling and destruction of vegetation; 2) occasional vandalism; 3) litter accumulations which can injure fish and wildlife; 4) occasional uncontrolled fires (including peat) caused by: careless smokers, ORVs, campfires and arsonists; 5) localized and increased traffic into natural areas; and 6) air pollution.

It should be noted, however, that the loss of habitat can be attributed to other than recreation sources, such as conversion of Delta land to residential development. How much habitat loss which can be attributed exclusively to recreation is unknown.

Boat-Wake. Boat-wake, as previously discussed in this briefing paper, is a contributing cause of levee erosion, which can result in loss of wildlife habitat.

Fires. For some recreationists, especially bank anglers, campfires are important to their enjoyment of the Delta. Occasionally, a campfire will get out of control, destroying some of the surrounding riparian habitat. In suppressing this type of fire, the slow response time from a distant fire department is often the biggest problem. The damage caused by anglers and campers seeking firewood, however, may be a bigger long-term threat to the riparian habitat than occasional wildfires (Doody, pers. comm.).

Off-Road Vehicles. Some hunters using off-road vehicles will damage agricultural land, but it is not a wide-spread problem (Doody, pers. comm.).

### SECTION III. INTERRELATIONSHIPS

In resolving the many varied problems which affect the Delta, it is important to recognize and understand the interrelationships between the Delta's competing values: natural resources, economics and recreation. These interrelationships are discussed below.

#### Interrelationship Between Recreation and Agriculture.

Recreation and agriculture are both competing for the Delta's limited supply of fresh water. Pumping water out of the Delta for the benefit of agriculture may be detrimental to fishing, wildlife viewing and some types of boating. A significant reduction of water in the Delta could reduce the amount of surface area available for boating and reduce the suitability of some sloughs for small watercraft such as canoes and kayaks.

Conversely, if providing additional irrigation water benefits agricultural crops, more crops may provide better feed and cover for wildlife, thereby benefiting both hunting and wildlife viewing.

Recreation and agriculture are also competing for the Delta's limited supply of land. The need to preserve existing agricultural land, and to prevent conversion of this land to non-agricultural uses, is well established. However, to provide for adequate public access to Delta waterways, and to provide for needed recreational areas and facilities, it may be necessary to acquire agricultural land.

The interrelationship between recreation and agriculture can also be mutually beneficial. Recreationists who belong to a hunting club will benefit from the use of the private agricultural lands, while the landowner will benefit from the hunting fees, which can be used to off-set the cost of recreation induced recreation expenses such as replacing rip-rap, or for other operating expenses.

#### Interrelationship Between Recreation and Fish and Wildlife.

Fish and wildlife attract many recreationists to the Delta. Unfortunately, the thoughtless actions of a few people can result in uncontrolled fires, accelerated levee erosion, littering, trampling of vegetation and water pollution, all of which can help to destroy the same natural environment which so many find attractive.

Paradoxically, at least one form of recreation, hunting, can benefit wildlife. Duck and pheasant clubs, which are managed to attract game birds, can also provide food and cover for non-game

species of waterfowl and other wildlife. By developing permanent wildlife habitat areas within agricultural islands, enhancing seasonal (fall/winter) habitat by leaving crop residue in the fields, and by flooding, these tracts of land can provide habitat for many types of wildlife (Aramburu, pers. comm.).

#### Interrelationship Between Recreation and Riparian Habitat.

Riparian habitat is not only essential for wildlife, it also provides natural shade for boaters and campers. Some tall vegetation is essential for shaded riverine aquatic habitat. Recreationists, however, who trample vegetation and cut trees for firewood are a threat to riparian habitat.

#### Interrelationship Between Recreation and the Local Economy.

The interrelationship between local residents and recreationists can be mutually beneficial. The goods and services provided by local merchants can be an essential element of a good recreational experience. The income generated from recreationists can help to support the local economy and to provide jobs for local residents.

Not all out-of-town recreationists, however, are appreciated. Some local residents complain that visitors litter the countryside, clog local highways, tax local services and inflate local prices.

#### Interrelationship Between Recreation and Private Property Rights.

The interrelationship between recreationists and property owners is one of resentment and frustration. Since most of the Delta is privately owned, many recreationists will trespass to use the levees for fishing or to gain access to waterways. Property owners resent the invasion of privacy and damage caused by the trespassers. They are also frustrated over the inability of the government to resolve the problem. Recreationists are probably equally frustrated over the lack of public parking along the levee roads, the lack of legal access to the waterways and the lack of public recreation facilities in the Delta. The need to protect private property from trespass should be considered in any future efforts to provide better public access and more public recreation facilities.

#### Interrelationship Between Recreation and Flood Control.

For many years, recreationists have benefited from the flood control protection afforded by the Delta's levee system. The levee vegetative cover which benefits the Delta's wildlife and is aesthetically pleasing to recreationists, also makes levee inspections more difficult and levee maintenance more costly.

Construction of recreation facilities such as marinas and boat launch ramps, however, do not seem to have a significant impact on the levees' flood control function.

#### Interrelationship Between Public and Private Recreation.

The interrelationship between public and private recreation in the Delta is unique. There is probably no other public waterway in California where there is so much recreation and so few public facilities. Fortunately, the existing inventory of private marinas is able to provide a good supply of launch ramps and related boating facilities, supplies and services. In the Delta, the private sector, not the government, is the primary supplier of public recreation facilities and services.

#### Interrelationship Between Recreation and Other Delta Resources.

Since the early 1960s, there have been many proposals for improving public access in the Delta, and for providing adequate recreation areas and facilities. Unfortunately, most of these proposals have a direct or indirect negative impact on the biological or agricultural resources. For example, proposals to acquire additional areas for boating or other active recreation purposes would reduce the areas available for wildlife habitat and increase the exposure of wildlife to detrimental outside influences.

Similarly, proposals to increase recreation, if not properly managed, could also increase opportunity for trespassing onto adjoining private lands and reduce productive agricultural lands. Also, increased recreation activities, especially boating, would affect levee maintenance efforts and increase water and air pollution.

Conversely, efforts to improve some other Delta resources could have a negative impact on recreation. For example, proposals to restore shaded riverine aquatic habitat would reduce the opportunity for development of recreational facilities. Also, proposed restrictions on boat speeds to protect levees from damage due to boat-wake could significantly reduce public's enjoyment of that recreational activity.

## SECTION IV. RESOURCE MANAGEMENT DECISIONS: ISSUES AND ACTIONS

This section discusses the resource management decisions which can be used to manage the impacts of recreation on the Delta, as identified in Section II. These include the impact of recreation on levees, waterways, public and private lands and biological resources (fish, wildlife, and riparian habitat). The more important impact factors are identified as "issues" below. Each issue is followed by suggested "actions" which could be used to mitigate the impacts.

### Management of Recreation Impact on Levee Resources: Issues and Actions

The impact of recreation on the Delta's levee system can be mitigated by taking action to address several issues: providing an equitable funding source for levee maintenance, coordinating area-wide planning efforts and reducing boat-wake on waterways.

Issue one: the current level of funding available for levee maintenance is inadequate and a disproportionate share of the financial burden falls on the landowners.

For generations, the public has actively used the Delta for recreation, and other purposes, without contributing to the cost of maintaining the intricate levee system. Additional funding is needed to address impacts associated with recreational activity occurring in the Delta. These funds could supplement the existing levels of funding for levee maintenance.

*Action A: investigate ways to require recreationists to contribute to levee maintenance.* As part of this proposed investigation, both the recreational benefits enjoyed by the general public and the impacts of recreational facilities and activities on the levee system should be evaluated. The Council can recommend that a cost sharing program be developed to generate revenue to fund supplemental levee maintenance. This action could be implemented as part of efforts to improve flood control facilities and environmental restoration within the Delta.

*Action B: coordinate existing levee assessments and funding programs.* Coordination of existing levee assessment and funding programs is necessary to maximize the use of limited funds available for levee maintenance. The Council can recommend that a partnership be formed among existing agencies to coordinate the existing levee assessments and funding programs as part of efforts to improve flood control

facilities, and improve environmental restoration within the Delta.

**Action C: alternative sources of labor and funds could be used to provide supplemental maintenance of Delta levees.** The California Conservation Corps, prison work furlough crews and other sources of low-cost labor could be used to assist in levee maintenance. This would help to maximize the use of limited public and private funds currently available for this purpose. Recreation oriented groups and organizations with a vested interest in sustaining their use of the Delta could be invited to donate labor and/or funds for levee maintenance. This effort could be similar to Caltrans' successful "adopt a highway" program. Examples of organizations which may be willing to volunteer time and/or funds would be: local water ski, yacht and hunting clubs, local service organizations and local youth organizations such as the Boy Scouts. Labor and funds provided would help to mitigate impacts associated with recreational activities. Examples of possible volunteer work projects would be litter/trash clean-up, replacement of rip-rap, installation and maintenance of "no-trespassing" signs and installation and maintenance of trash receptacles. In addition, the business community could be encouraged to provide financial support for levee maintenance. From local businesses to large corporations, any organization with a financial interest in sustaining recreation in the Delta could be solicited. Manufacturers of recreational equipment used in Delta, such as jet skis, powerboats and fishing gear, could be potential sponsors. Local marinas and other business which are dependent upon the recreating public should also be included. All labor and financial donations should be used to supplement, not supplant, existing levels of levee maintenance. The council could encourage the use of these alternative sources of labor and funds as part of efforts to improve flood control facilities and/or water conveyance facility construction within the Delta.

Issue Two: land-use plans developed by public agencies can address recreational issues differently, sometimes resulting in conflicting recreational uses of Delta levees.

The inappropriate placement of recreation facilities such as marinas is one example.

**Action A: coordinate area-wide recreation planning.** Coordination of area-wide recreational planning can address encroachment of recreational facilities on or

near levees. This effort is necessary to prevent recreational plans from precluding or impairing the flexibility of implementing proposals to address levee issues. The council can consider recommending a partnership with the Delta Protection Commission (DPC) to provide this coordination function. This action could be implemented as part of the DPC's regional planning administration responsibility within the Delta.

***Action B: coordinate acquisition and development of proposed recreational facilities.*** Coordination of designated areas for proposed recreational facilities can assist in controlling recreational-induced impacts on levees. This effort may require modifications to existing plans from various agencies. Modifications of levee standards/configurations can require adjustments to proposed recreation facilities, or preclude them altogether. The council can consider recommending a partnership among existing agencies to provide this coordination function.

Issue Three: boat-wake has been identified as a contributing factor to levee erosion in the Delta.

Boat-wake has been identified as one source of levee erosion which can be mitigated. The significance of boat-wake, however, when compared to other erosive factors is not known.

***Action A: evaluate the need for additional study of the impact of boat-wake on Delta levees.*** At least two Delta boat-wake studies have been completed. Both studies, however, were inconclusive in that they could not adequately determine the impact of boat wake on the total levee system. Both studies stressed the need for additional research. The council could recommend that another, more comprehensive, study be conducted as part of efforts to improve flood control facilities and environmental restoration within the Delta.

***Action B: study the need to establish boat speed zones in appropriate locations throughout the Delta.*** Restrictions on boat speed can reduce boat wake erosion along the levees. Enforcement of these restrictions may also serve to reduce vandalism to the levees. Speed restrictions, however, may have a severe impact on the recreational needs of the boating public. A study may be needed to determine both the potential benefits and potential problems created by reduced speed zones. The council could recommend that

such a study be conducted as part of efforts to improve flood control facilities and environmental restoration within the Delta.

**Management of Recreation Impact on Waterways Resources: Issues and Actions.**

The impact of recreation on the Delta's waterways can be mitigated by providing an adequate boat patrol program to enforce existing rules and regulations.

**Issue Four: an effective boat patrol program is needed to enforce boat safety regulations and to discourage trespass on private property in the Delta.**

Currently, a number of law enforcement agencies at the county, state and federal level provide a variety of boat patrol functions in the Delta. Due primarily to a lack of funds, enforcement patrols are typically under-staffed and under-equipped. Sacramento County's marine patrol budget has been reduced from \$750,000 in 1990 to \$160,000 this past year (Sacramento Bee).

A second concern may be the lack of coordination between the various boat patrol programs which include the sheriff's offices of the five Delta counties, the California Department of Fish and Game, the California Department of Parks and Recreation, the US Coast Guard, and the US Fish and Wildlife Service. These agencies can communicate with one another by radio, and infrequently do so during search and rescue and other emergency efforts. However, there is little effort to coordinate routine patrols and little effort to promote boating safety or to secure adequate funding for Delta marine law enforcement.

***Action A: provide adequate funding for boat patrol programs in the Delta.*** In one recent effort to provide more funding, a bill was introduced in the California Legislature which would allow the five Delta counties to increase, from \$5 to \$15, the fee to be paid when boat owners renew their registration each year. The money would be spent only on increasing marine patrols in the Delta. For affected counties, the fee increase would raise \$1.2 million (SF. Chron.). The council can consider supporting similar legislation as part of the implementation of Delta solution actions.

***Action B: coordinate the various boat patrol programs now operating in the Delta.*** Coordination should probably be provided by a single state or federal agency capable of coordinating the efforts of all affected government agencies. The council can consider

recommending a partnership among affected agencies to ensure that this coordination function is provided.

Issue Five: boating safety should be improved and conflicts between incompatible uses of the waterways should be reduced.

*Action A: determine the feasibility of requiring violators of boating safety laws and/or young boat operators to take a boating safety course.* The Department of Boating and Waterways has recommended a mandatory safety course for all young boat operators and boating safety violators. The council can consider recommending that such a study be undertaken as part of the implementation of Delta solution actions.

*Action B: determine the feasibility of establishing and enforcing special recreational use zones on some Delta waterways.* A reduction in the number of conflicts between competing water recreation activities may be possible if special use zones were established to prevent incompatible uses such as water skiing and bank fishing. The Council can consider recommending that such a study be made as part of the implementation of the Delta solution actions.

Management of Recreational Impact on Public/Private Lands: Issues and Actions.

The impact of recreation on public and private lands can be mitigated by providing better public access to public lands, by resolving land title problems and by providing better access to public recreation areas.

Issue Six: access to public lands is very limited

Except for boaters, it is difficult for the recreating public to access the Delta's 1,100 miles of shoreline.

*Action A: encourage the acquisition of additional lands through fee title and/or easements from willing sellers to improve public access.* The council could consider such an action as part of efforts to improve flood control facilities, environmental restoration and/or water conveyance facility construction within the Delta.

**Action B: encourage state agencies and Delta counties to acquire, from willing sellers, easements for public access.** The Council could consider such an action as part of efforts to improve flood control facilities, environmental restoration and/or water conveyance facility constructed within the Delta.

Issue Seven: the amount of public land available for recreation is very limited.

Providing more public recreation areas is an important part of the long term solutions to the Delta problems. This can be accomplished by government and non-profit agencies acquiring more land and facilities for park and recreation purposes. These agencies should also work with the private sector to increase the use of private property for public recreation purposes.

**Action A: encourage the acquisition of additional lands for public recreation through the purchase of fee title and/or easements from willing sellers.** The council could consider implementing this action as part of efforts to improve flood control facilities, environmental restoration and/or water conveyance facility construction within the Delta.

**Action B: the State Lands Commission has proposed establishing its claim to many non-leveed channel islands, berms and waterways to make private owners aware of potential conflict over ownership, and eliminate controversies over claims to public lands by adverse possession.** Additional recreation lands could be made available for public use if the state would complete the necessary title work to document and substantiate all of its claims to public land in the Delta. The council could consider recommending funding State Lands Commission title work as part of efforts to improve flood control facilities, environmental restoration, and/or water conveyance facility constructed within the Delta.

**Action C: encourage public agencies to assume the responsibility and liability for maintaining currently private areas used for public recreation.** Certain reclamation districts with private lands have expressed a willingness to allow public use of their levees, provided that some public agency assumes the responsibility and liability for maintenance. The council could consider implementing this action as part of efforts to improve flood control facilities, environmental restoration and/or water conveyance facility constructed within the Delta.

**Action D: encourage public agencies to work cooperatively with private property owners.** The council may wish to consider public sector/private sector partnerships to provide financial assistance to private property owners for development and maintenance of any recreation facilities opened to the public as part of the implementation of Delta solution actions.

**Action E: encourage private marinas to incorporate more public recreation facilities.** Existing marinas could be encouraged to provide for public access to public waterways and, if possible, to provide additional public recreation space. Future marinas can be encouraged to provide direct public access to waterways and provide sufficient space for picnicking and scenic viewing. This action could be accomplished by providing incentives to existing and future marinas to provide public access to public waterways. The council can recommend providing incentives and financial assistance to marina owners for development and maintenance of all new recreation facilities opened to the public as part of Delta solution alternatives.

**Action F: encourage the development of fishing sites and a system of riding, hiking and bicycling trails.** The council can consider implementing this action as part of efforts to improve flood control facilities, environmental restoration, and/or water conveyance facility construction within the Delta.

**Action G: open more existing public land to controlled recreation such as hunting and fishing.** The council may wish to encourage public agency partnerships to provide coordination for development and maintenance for these facilities as part of the implementation of Delta solution actions.

Issue Eight: public parking of any kind in the Delta is in very short supply.

Levee roadside parking, which provides direct access to public waterways, is especially limited.

**Action A: the council can consider recommending the development of designated parking as part of efforts to improve flood control facilities, environmental restoration and/or water conveyance facility construction within the Delta.**

Issue Nine: more information on the location of public recreation opportunities in the Delta is needed to reduce trespass.

Some of the recreationists who inadvertently trespass on private property do so because they assume that the levees and the land abutting the levees are public property. This misconception is reinforced by the lack of "no-trespassing" signs on private property throughout the Delta. This problem could be reduced by providing visitors with brochures which identify the locations of public recreation areas and warn against trespassing on private property, and by providing adequate highway signs and information kiosks to direct visitors to public recreation facilities.

As part of efforts to improve flood control facilities, environmental restoration and/or water conveyance facility construction within the Delta, the council can consider recommending that:

*Action A: partnerships be forged between public agencies to provide appropriate signs and brochures.*

*Action B: partnerships be forged between public agencies to provide information kiosks at highway intersections and other appropriate locations.*

*Action C: partnerships be forged between private citizens and public agencies to post signs informing recreationists of boundaries to private and public lands. This can be accomplished as part of normal maintenance, levee repair projects, environmental restoration and development projects.*

Issue Ten: area-wide land use planning should be coordinated to maximize use of existing and future recreational opportunities.

The five Delta counties, and numerous affected state and federal agencies, have a strong interest in the Delta, but what has been lacking is a coordinated effort to share this interest. Because of these overlapping jurisdictions and the interrelated environmental problems of the Delta, there is an obvious need for planning and coordinating on a regional basis.

*Action A: the council can encourage implementation of the regional planning and permit process for private recreation facilities, development, and land zoning changes within the Delta Protection Commission.*

Management of Recreational Impact on Biological Resources (Fish, Wildlife and Riparian Habitat): Issues and Actions.

The impact of recreation on the biological resources of the Delta can be reduced by coordinating the area-wide recreation planning efforts of state, federal and local agencies by providing additional recreation facilities and improving access to existing recreation areas throughout the Delta, by establishing and enforcing speed zones on Delta waterways to reduce boat wake, by enforcing public sanitation and pollution regulations and by providing agricultural landowners incentives to provide access for hunting.

Issue Eleven: coordination of area-wide resource planning is necessary to prevent disturbance to sensitive wildlife and habitat areas.

Agencies responsible for resource planning often develop plans which may address resource issues differently, thereby resulting in inappropriate or conflicting uses of the Delta's resources. Coordination of this planning effort is necessary to prevent encroachment of recreational facilities into sensitive habitat areas. Coordination may also require the modification of existing plans prepared by various government agencies. Designation of suitable areas for increased public access and more recreational facilities can assist in controlling development in these sensitive areas. However, an increase in recreational opportunities may also increase the disturbance of wildlife and increase the illegal take of wildlife species.

*Action A: the council can encourage implementation of the regional planning and permit process for private recreation facilities, development, and land zoning changes within the Delta Protection Commission.*

Issue Twelve: inadequate recreation areas and facilities in the Delta can cause recreationists to use sensitive habitat and wildlife areas.

*Action A: provide more recreation areas and facilities.* By providing more recreation areas and facilities, existing and proposed habitat areas can benefit by restricting intensive recreation use to suitable designated areas. However, an increase in recreational opportunities can impair implementing proposals for additional habitat restoration and increase disturbance to existing habit areas. The council could consider encouraging partnerships

between public and private agencies to provide more public recreation areas.

Issue Thirteen: dumping untreated sewage, gasoline, oil, lead-base paints and other contaminants into Delta waters is a threat to land and aquatic habitats.

Marinas and recreational boaters are partially responsible for the reduction of water quality in the Delta. Although dumping untreated sewage, gasoline, oil, lead base paints and other contaminants into the Delta is illegal, it continues to be a problem. More can be done to detect such activity and prosecute those responsible. Enforcement of public sanitation requirements, dumping regulations, etc. will improve habitat areas. Vigilant enforcement of these restrictions may also benefit habitat by reducing vandalism and litter, and discouraging recreation in sensitive areas.

*Action A: the council can encourage the forging of partnerships between public and private agencies, and local citizens, to enforce sanitation requirements for boats and marinas. This action can be implemented as part of efforts to improve water quality and environmental restoration in the Delta.*

Issue Fourteen: boat-wake, as a contributing factor to levee erosion, has a negative impact on wildlife and riparian habitat.

A reduction in boat speeds in waterways adjacent to unprotected levees will help to minimize erosion and protect sensitive habitat which may be essential for protection of endangered wildlife. Enforcement of these restrictions may also benefit habitat by reducing vandalism, litter and recreation in sensitive areas. These restrictions, however, will undoubtedly discourage some boaters from using the Delta and could have a negative impact on the local economy.

*Action A: evaluate the need for a study on the impact of boat-wake on the Delta's biological resources, including aquatic organisms. This action, like Action A, Issue Three (page 32), identifies the need for a study on the impact of boat-wake on the Delta. However, this action specifically identifies the need to include in the study the impact of boat-wake upon biological resources. The council can support the need for such a study as part of efforts to improve environmental restoration in the Delta.*

Issue Fifteen: use of agricultural land for recreation can reduce impacts to sensitive habitat areas.

The Delta is largely private agricultural lands adjacent to public waterways. Providing better use of existing agricultural lands for public recreation purposes can benefit the Delta's natural resources by diverting recreationists away from sensitive habitat areas. However, proposals to increase the use of private agricultural lands can increased the need for protection of adjoining private property. Without adequate controls, an increase in public use could result in an increase in disturbances to landowners and their families, and increases in opportunities for vandalism.

**Action A: encourage use of agricultural land for hunting, fishing, boating and other public recreation purposes.** The use of agriculture land for recreation should be encouraged and rewarded by government agencies. As agricultural land is used for recreation, the level of impact on all private property and facilities in the immediate vicinity should be evaluated. Although a funding source may be necessary to provide compensation to property owners to encourage this dual use, the use of a tax break or tax incentive should also be considered as an alternative. The council can encourage the forging of a public/private partnership between the property owners and those government agencies which have a responsibility for providing recreational opportunities in the Delta.

Issue Sixteen: prohibiting active recreation in sensitive wetlands will help to mitigate the impact on wildlife and riparian habitat.

As part of efforts to improve environmental restoration within the Delta, the council can consider recommending that:

**Action A: a partnership be formed between public agencies and private property owners to identify and sign all sensitive wetlands.**

**Action B: a partnership be formed between state, local and federal government agencies to secure assistance of law enforcement agencies.**

**Action C: a partnership be formed between the five Delta counties to prohibit the development of public**

**access and recreation facilities in sensitive habitat areas through the general planning process.**

Issue Seventeen: providing improved access to existing public recreation areas can benefit riparian habitat and wildlife by diverting recreationists away from sensitive areas.

As part of efforts to improve environmental restoration within the Delta, the council can consider recommending that:

**Action A: partnerships be forged between public agencies and landowners to provide better access to public lands and facilities.**

**Action B: partnerships be forged between public agencies to provide maps, brochures and road signs showing the location and boundaries of appropriate public recreation areas.**

**Action C: partnerships be forged between public agencies and landowners to provide appropriate boundary signs to discourage use of sensitive habitat areas.**

**TABLE 1**  
**POPULATION ESTIMATES AND FORECASTS**  
 (IN THOUSANDS)

COUNTY	1990	1995	2000	2005	% CHANGE 1990 - 2005
Contra Costa	810	893	971	1,035	22%
San Joaquin	484	548	624	697	31%
Sacramento	1,051	1,188	1,329	1,454	28%
Alameda	1,282	1,377	1,457	1,514	15%
Solano	346	414	478	523	34%
<b>TOTAL</b>	<b>3,973</b>	<b>4,420</b>	<b>4,859</b>	<b>5,223</b>	<b>24%</b>

Source: Department of Finance, Population Research Unit - 1994

TABLE 2

DELTA RECREATION STUDIES AND DOCUMENTS

Provided below is a list of the recreation and planning studies, prepared by a variety of State, local and federal government agencies, listed in chronological order of publication:

- \* Sacramento River and Delta Recreation Study (1961).  
Department of Water Resources
- \* Sacramento-San Joaquin Delta Master Recreation Plan  
(1966). Resources Agency
- \* Sacramento-San Joaquin Delta Master Recreation Plan  
(1973). Resources Agency
- \* Delta Action Plan (1976). Delta Advisory Planning Council
- \* Sacramento-San Joaquin Delta Master Recreation Plan  
(1976). Resources Agency
- \* Sacramento-San Joaquin Delta Recreation Survey (1980).  
Department of Water Resources
- \* Sacramento-San Joaquin Delta Wildlife Habitat Protection  
and Restoration Plan (1980). Department of Fish & Game
- \* Sacramento-San Joaquin Delta Recreation Concept Plan  
(1981). Department of Water Resources
- \* Sacramento-San Joaquin Delta Outdoor Recreation  
Implementation Plan (1981). Department of Water Resources
- \* Draft EIS for Sacramento/San Joaquin Delta. 1982. Corps  
of Engineers
- \* Recreation Facilities Plan for North & South Delta. 1988.  
Department of Water Resources
- \* Delta Estuary, California's Inland Coast. 1991. State  
Lands Commission
- \* South Delta Recreation Study (1988). US. Bureau of  
Reclamation
- \* EIR/EIS North Delta Program (1990). Department of Water  
Resources

\* South Delta Water Management Program (1992). Department of Water Resources

\* General Recreation Plan for Sacramento-San Joaquin Delta (1992). US. Army Corps of Engineers

\* Interim North Delta Program Draft Recreation Use Survey Report (1993). Department of Water Resources

\* Delta Protection Commission Recreation and Access Study (1994). Delta Protection Commission

In addition, there are a number of other planning efforts prepared for specific geographical areas in the Delta:

\* Resource Management and General Development Plan for Bethany Reservoir. 1973. Department of Parks and Recreation

\* Recreation and Access in the Suisun Marsh (1976). SF. Bay Conservation District

\* Delta Recreation and Park Area (Sacramento County Service Area 4-C) Master Plan 1977-1987 (1977). Sacramento County (Jones & Stokes)

\* A report on Boating in the San Joaquin County (1979). San Joaquin County Planning Department

\* Delta Community Area Plan - Recreation Element (1982). Sacramento County Planning Department

\* General Plan for Brannan Island and Frank's Tract State Recreation Areas (1988). Department of Parks and Recreation

\* EIS for Stone Lakes National Wildlife Refuge (1992). US. Fish & Wildlife Service

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RECREATION THE DELTA**

**Table 3  
EXISTING RECREATIONAL FACILITIES**

<b>Name</b>	<b>Operating Agency</b>	<b>Facilities Provided</b>
Brannan Island State Recreation Area	State Department of Parks and Recreation (DPR)	Land and water access; launch ramp, swimming beach, camp sites, picnic areas, parking, restrooms, interpretive center.
Clifton Court Forebay	Department of Water Resources and Department of Fish and Game	Land access; Parking, only portion of reservoir available for fishing, need special permit.
Franks Tract and Little Franks Tract	DPR	Water access only; few facilities.
Antioch fishing sites and one fishing pier	City of Antioch	Land and water access; pier, parking, restrooms.
Hogback Park	Sacramento County Parks and Recreation (SCPR)	Land and water access; launch ramps, guest dock, picnic area, parking, restrooms.
Lower Sherman Island	SCPR	Land and water access; launch ramp, parking, restrooms.
Clarksburg Boat Ramp	Yolo County Parks Department	Land and water access; launch ramp, unpaved parking, restrooms.
Oak Grove Regional Park	San Joaquin County Parks Department	Land access; lake, picnic area, dock, natural trails, interpretive center.
Delta Meadows	DPR	Land and water access; few facilities.
Rio Vista Public Launch Ramp	City of Rio Vista	Land and water access; parking, launch ramp.
Rio Vista riverbank	City of Rio Vista	Land and water access; pier, barbecue pits, parking.
Sandy Beach Park	Solano County Parks Department	Land and water access; campsites, showers, picnic area, parking, beach area, paved roads.
Borrow Ponds	Department of Water Resources	Land access; fishing ponds as part of undeveloped Peripheral Canal right-of-way.
Watergate Landing Park	San Joaquin County Parks Department	Land and water access; camping, boat launch, restroom, few day uses for picnic.

**Table 3  
Existing Recreation Facilities (Cont.)**

<b>Name</b>	<b>Operating Agency</b>	<b>Facilities Provided</b>
Buckley Cove Marina Park	City of Stockton	Land and water access; water frontage, fishing, berths, launch lanes, parking, restrooms, gas & repair services, snack bar, playgrounds, organized recreational programs.
Fritz Grupe Park	City of Stockton	Land and water access; water frontage, fishing, picnic area, parking, bicycle racks, playing fields, restrooms, organized recreational programs.
Channel I-5 boat ramp park	City of Stockton	Land and water access; dock, launch lanes, sailing, low speed boating, picnic area, restrooms.
Louis Park	City of Stockton	Land and water access; water frontage, bank fishing, dock, launch lanes, boating, parking, bicycle racks, picnic areas, playing fields, restrooms, snack bar, organized recreational activities.
Dos Reis County Park	San Joaquin County Parks Department	Land and water access; water frontage, launch ramp, water activities, RV camp sites.
Mossdale Crossing Park	San Joaquin County Parks Department	Land and water access; launch ramp, parking, restrooms.
Georgiana Slough Fishing Access	SCPR	Land and water access; parking, launch ramp restrooms.
Cliff House Fishing Access	SCPR	Land and water access; parking, restrooms.

Source: State Lands Commission, 1991.

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