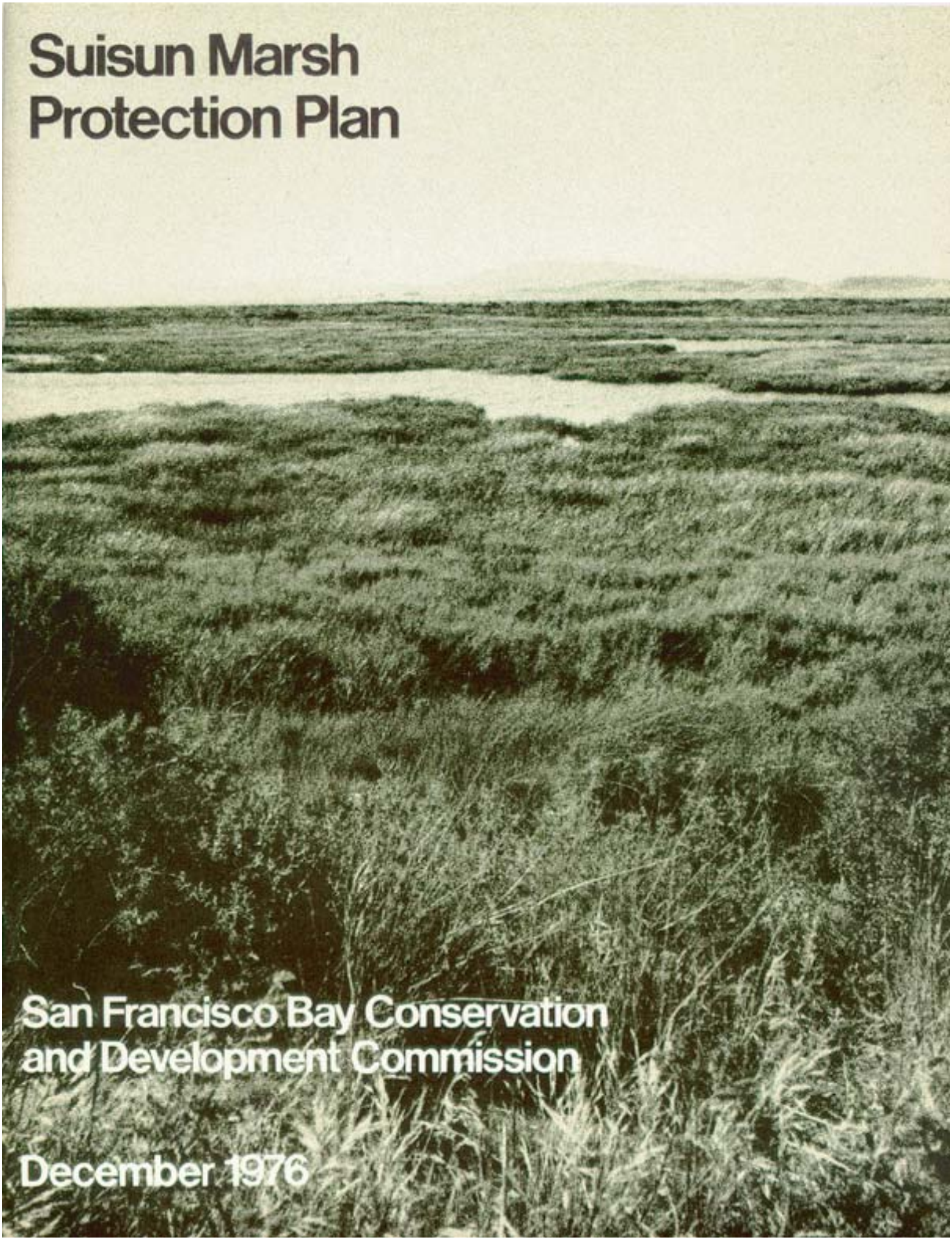
Suisun Marsh Protection Plan



San Francisco Bay Conservation and Development Commission

December 1976

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December 17, 1976

TO GOVERNOR EDMUND G. BROWN JR., AND
MEMBERS OF THE CALIFORNIA LEGISLATURE

We are pleased to submit, pursuant to the Nejedly-Bagley-Z'berg Suisun Marsh Preservation Act of 1974 (SB 1981), a Suisun Marsh Protection Plan.

Bordering the northern Bay, just west of the Delta, "the Marsh represents a unique and irreplaceable resource to the people of the state and nation;" and as ". . . the future of the wildlife values of the area is threatened by potential residential, commercial and industrial developments . . ." (SB 1981). The Marsh comprises about 10 percent of California's remaining wetlands. Thus, it plays an important role for water fowl of the Pacific Flyway and provides critical habitat for other wildlife species.

In brief, the Plan proposes (1) a primary management area encompassing the 89,000 acres of tidal marsh, managed wetlands, adjacent grasslands, and waterways over most of which BCDC now has jurisdiction, and (2) a secondary management area of approximately 22,500 acres of significant buffer lands. Under specific guidelines in each area, Solano County would be responsible for preparing and administering a local protection program. BCDC would represent the state's interest, serving as the land use permitting agency for major projects in the primary management area, and as an appellate body with limited functions in the secondary management area.

The Plan also recommends that the state consider purchase of approximately 1,800 acres of marsh; that water quality in the Marsh be maintained; and that land tax assessing practices reflect the conditions of the Plan.

The Plan development process included 17 public hearings, two by the Department of Fish and Game on the fish and wildlife element. The others were held by BCDC on additional elements and on the draft Plan. BCDC recommended this final Plan after two further Commission meetings.

Although not every viewpoint offered was accepted, all were carefully considered and many do now appear in the Protection Plan. The Commission is most appreciative of the beneficial participation of public jurisdictions and agencies, private organizations and individuals, and of the capable and dedicated work of BCDC's staff.

Respectfully,

JOSEPH C. HOUGHTELING
Chairman

JCH/st

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Commissioners

The BCDC consists of 27 members who represent Federal, State, and local governments and the general public. Names of Commissioners' alternates are shown in parentheses.

Public Representatives

Joseph C. Houghteling, Atherton, Chairman-appointed by the Governor
(George Kane, Los Gatos)

Mrs. Dean A. Watkins, Vice Chairman, Portola Valley, civic leader-appointed by the Governor
(Mrs. John A. Gast, Belmont)

Harry A. Bruno, Oakland, architect-appointed by the Governor (Frank E. McClure, Oakland)

Earl P. Mills, San Francisco, San Francisco Redevelopment Agency- appointed by the Speaker of the Assembly (Skip Berg, Tiburon)

Mrs. Ralph N. Jacobson, Hillsborough, civic leader-appointed by the Governor
(Mrs. Michael E. Stickney, San Mateo)

Ms. Elizabeth Osborn, Fremont, civic leader-appointed by the Senate Rules Committee
(Ms. Patricia Shelton, Cupertino)

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(Richard L. O'Connell)

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Supervisor Sam Chapman of Napa County
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BCDC Advisory Committee

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Mayor James Ballentine of Newark (Councilman Robert Norris of Redwood City)

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Authors of the "Fish and Wildlife Element" for the Department of Fish and Game.

Ross Design, Publication Design, San Francisco; Plan Design and Layout.

Richard Conrat, Healdsburg, Photographer, all Plan Photographs.

Protection Plan Public Hearings

Seventeen public hearings were held in preparation of the Suisun Marsh Protection Plan. The Department of Fish and Game held two hearings on the Fish and Wildlife Element before submitting it to BCDC. The Commission conducted 15 hearings on planning background reports and the draft Plan. The subject of each hearing, date, and place follow:

(1) Fish and Wildlife Element;
November 24, 1975; Fairfield.

(2) Fish and Wildlife Element;
December 9, 1975; Fairfield.

(3) Suisun Marsh Environment;
April 15, 1976; Fairfield.

(4) Suisun Marsh Aquatic and Wildlife Resources;
April 15, 1976; Fairfield.

(5) Water Supply and Quality in the Suisun Marsh;
May 20, 1976; Oakland.

(6) Water Supply and Quality in the Suisun Marsh;
June 3,1976; San Francisco.

(7) Natural Gas Resources of the Suisun Marsh;
June 17, 1976; San Francisco.

(8) Recreation and Access in the Suisun Marsh;
July 1, 1976; Oakland.

(9) Developing an Implementation Program for the Suisun Marsh Protection Plan;
July 15, 1976; San Francisco.

(10) Developing an Implementation Program for the Suisun Marsh Protection Plan;
August 5, 1976; San Francisco.

(11) Water-Related Industry Adjacent to the Suisun Marsh;
August 5, 1976; San Francisco.

(12) Developing an Implementation Program for the Suisun Marsh Protection Plan;
August 19, 1976; San Francisco.

(13) Suisun Marsh and Upland Resource Management;
September 2, 1976; Oakland.

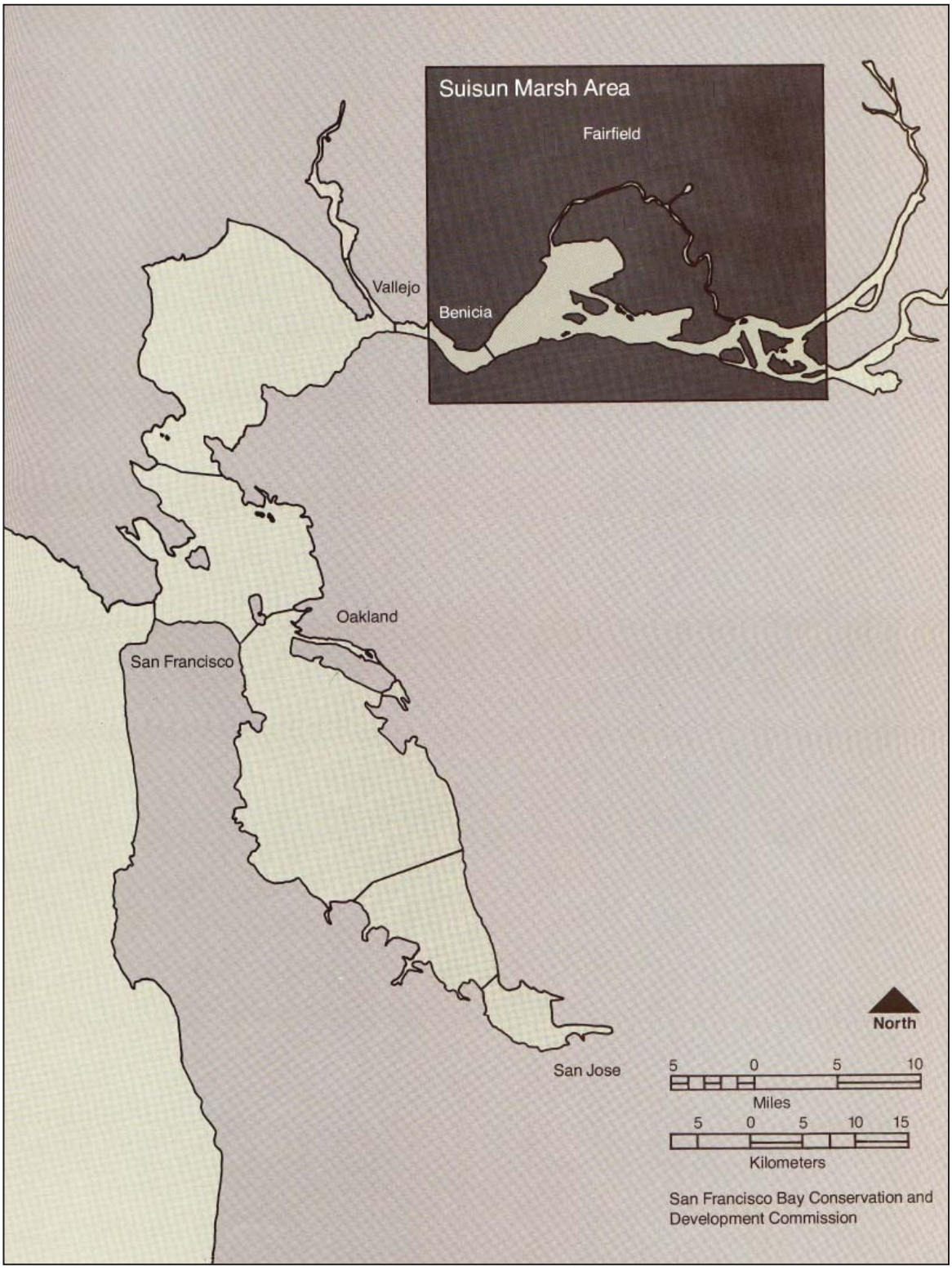
(14) Public Facilities, Utilities, and Transportation in and Around the Suisun Marsh;
October 7, 1976; San Francisco.

(15) Preliminary Suisun Marsh Protection Plan;
October 14, 1976; Fairfield.

(16) Preliminary Suisun Marsh Protection Plan;
October 21, 1976; San Francisco.

(17) Preliminary Suisun Marsh Protection Plan;
November 4, 1976; Fairfield.

The Commission held two additional meetings in San Francisco on November 18, 1976, and December 2, 1976, to discuss and vote on the final recommended Plan.


Suisun Marsh Area
Fairfield
Vallejo
Benicia
Oakland
San Francisco
San Jose
North
5 0 5 10
Miles
5 0 5 10 15
Kilometers
San Francisco Bay Conservation and
Development Commission

PART I

INTRODUCTION

The Suisun Marsh comprises approximately 85,000 acres of tidal marsh, managed wetlands, and waterways in southern Solano County. It is the largest remaining wetland around San Francisco Bay and includes more than ten percent of California's remaining wetland area. The Marsh is also a wildlife habitat of nationwide importance. It plays an important role in providing wintering habitat for waterfowl of the Pacific Flyway and, because of its size and estuarine location, supports a diversity of plant communities. These provide habitats for a variety of fish and wildlife, including several rare and endangered species.

Recognizing the threats to the Suisun Marsh from potential residential, commercial, and industrial developments, and the need to preserve this unique wildlife resource for future generations, the California Legislature passed and the Governor signed in September, 1974, the Nejedly-Bagley-Z'berg Suisun Marsh Preservation Act of 1974. The Act directs the San Francisco Bay Conservation and Development Commission and the Department of Fish and Game to prepare the Suisun Marsh Protection Plan "to preserve the integrity and assure continued wildlife use" of the Suisun Marsh.

The California Department of Fish and Game prepared a Fish and Wildlife Element to be used by the San Francisco Bay Conservation and Development Commission in the preparation of the Suisun Marsh Protection Plan. The Fish and Wildlife Element includes an inventory of the ecological characteristics of the Marsh and its surroundings, and a recommended natural resource protection plan. Information and recommendations provided by this element have been incorporated into the Suisun Marsh Protection Plan.

The planning program conducted by the San Francisco Bay Conservation and Development Commission involved the preparation and tentative adoption of a series of nine background planning reports: Suisun Marsh Environment; Suisun Marsh Aquatic and Wildlife Resources; Water Supply and Quality in the Suisun Marsh; Natural Gas Resources of the Suisun Marsh; Recreation and Access in the Suisun Marsh; Utilities, Facilities and Transportation in and Around the Suisun Marsh; Water-Related Industry Adjacent to the Suisun Marsh; Suisun Marsh and Upland Resource Management; and Developing an Implementation Program for the Suisun Marsh Protection Plan. These reports provided the

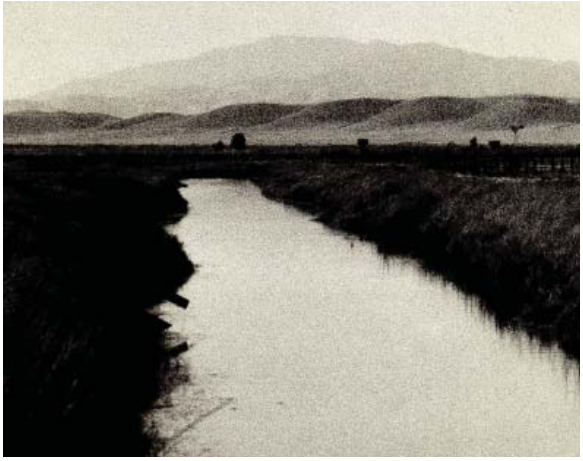
information needed to prepare the findings and policies of the final Suisun Marsh Protection Plan, as well as allowing extensive opportunities for public involvement through hearings before the Commission. The Fish and Wildlife Element and the background planning reports are the basis for the Plan and will be submitted to the Governor and Legislature as a supplement.

The objectives of the Protection Plan are to preserve and enhance the quality and diversity of the Suisun Marsh aquatic and wildlife habitats and to assure retention of upland areas adjacent to the Marsh in uses compatible with its protection.

The Protection Plan consists of four sections. Part I, the Introduction, describes the planning program and Plan objectives. Part II provides the Plan's Findings and Policies. Part III describes the program for carrying out the Plan, and Part IV consists of the Protection Plan Map and a map illustrating the Marsh natural factors.

PART II

FINDINGS AND POLICIES



ENVIRONMENT

The aquatic and terrestrial habitats of the Suisun Marsh and adjacent uplands support many species of fish and wildlife, primarily because of the diversity, quality, and close proximity of its varied habitats. These habitats are particularly important to the wintering waterfowl of the Pacific Flyway and to the striped bass, which is the most important game fish in the San Francisco Bay and Delta System.

There are three types of wetlands in the Suisun Marsh: managed wetlands, tidal marshes, and seasonal marshes. Most of the wetlands in the Marsh are managed wetlands that are artificially flooded and cultivated by the California Department of Fish and Game and private duck clubs to enhance the production of preferred waterfowl food plants. The tidal marshes, which occur on the edges of the bays and sloughs, are not subjected to habitat management programs, but are exposed to the natural daily tidal rhythm. Seasonal marshes are found adjacent to the managed wetlands in several areas. They are low-lying lands that are flooded annually by winter and spring rains, and dry out with the approach of summer. Between the Marsh and adjacent uplands lies a "transition zone" of lowland grasslands, which supports a mixture of plants common to both the wetlands and the upland grasslands. Adjacent to the Suisun Marsh wetlands and lowland grasslands are upland grasslands and cultivated areas. These are used for extensive agriculture, such as grazing and grain production, and help protect the Marsh wetlands by insulating them from potential adverse impacts.

Findings

1. The Suisun Marsh and adjacent uplands provide a unique resource for a wide range of aquatic and wildlife species, due to the occurrence of many diverse habitats in close proximity to each other. This situation is the result of the natural estuarine character of the Suisun Marsh, the man-made habitat changes within the Marsh and the existence of extensively managed agricultural lands surrounding the Marsh.

2. The Suisun Marsh and adjacent uplands provide habitats for many rare and endangered plant and animal species. These include the giant garter snake, Aleutian Canada goose, bald eagle, peregrine falcon, California black rail, California yellow billed cuckoo, the salt marsh harvest mouse and seven plant species.

3. The Marsh sloughs are a major habitat for striped bass, the most important game fish in the San Francisco Bay and Delta system, and for the Neomysis shrimp, which is their primary food source. The Suisun Marsh provides a unique combination of low salinity level due to high Delta outflow, moderate temperatures, low pollution levels, availability of phytoplankton as food for Neomysis, and a gentle tidal current, all of which create an ideal environment for both the striped bass and Neomysis.

4. Tidal marsh is an important habitat for many wildlife species, including the endangered salt marsh harvest mouse and the Suisun shrew. Tidal marshes also contribute to the maintenance of water quality in the San Francisco Bay.

5. In the Suisun Marsh, about 50,700 acres of managed wetlands are currently maintained as private waterfowl hunting clubs and on publicly-owned wildlife management areas and refuges. Because of their extent, location and the use of management techniques to encourage production of preferred waterfowl food plants, managed wetlands of the Suisun Marsh are a vital component of the wintering habitat for waterfowl migrating south on the Pacific Flyway, and also provide cover, foraging and nesting opportunities for resident waterfowl. Managed wetlands also provide habitat for a diversity of other resident and migratory species, including other waterbirds, shorebirds, raptors, amphibians, and mammals. Managed wetlands can protect upland areas by retaining flood waters and also provide an opportunity for needed space for adjacent wetlands to migrate landward as sea level rises.

6. There are several seasonal marshes around the periphery of the managed wetlands. They have high value for marsh-related wildlife and also serve to buffer the Suisun Marsh to a certain extent from potential adverse ecological and aesthetic impacts.

7. The lowland grasslands adjacent to the Marsh constitute an important transition area between the Marsh and uplands and have high value for marsh related wildlife, particularly when the wetlands are flooded and during periods of high hunting pressure in the Marsh. They also play an important role in insulating the Suisun Marsh from potential adverse impacts from adjacent land uses, such as water pollution, predation by domestic pets, and noise.

8. The upland grasslands and cultivated areas adjacent to the Suisun Marsh provide habitats for many species of wildlife that also inhabit the Marsh. Several species of migratory waterfowl, shorebirds, and upland game birds feed in these areas, which also provide a refuge from winter flooding and hunting pressures in the marsh. Birds of prey range over the Marsh and adjacent uplands where the diversity of habitats ensures a varied and abundant source of food. The Potrero Hills grasslands are particularly important since they contain one of only two known golden eagle nest sites in Solano County.

9. The upland grasslands and cultivated areas adjacent to the Suisun Marsh are also critical to its protection. These undeveloped areas, presently used for extensive agriculture, function as a buffer for the Marsh, insulating it from potential adverse ecological and aesthetic impacts.

10. The fresh water habitats in streams tributary to the Marsh are important to the continued high quality of water in the Marsh sloughs. Tributary streams such as American Canyon and Jameson Canyon Creeks support important riparian vegetation along their banks. This vegetation helps to retain proper water temperatures in the stream chan-

nels and filter sediments that would be carried into the Marsh sloughs. It also provides an important habitat for Marsh wildlife, particularly birds, as well as insects and algae that are food for larger aquatic life.

11. The tributary streams are also important for migratory fish that spawn upstream from the Marsh. The Suisun, Green Valley, and McCoy Creeks have remained largely unobstructed by manmade structures and support the only remaining steelhead migratory runs in the Suisun Marsh area.

12. Eucalyptus trees are the major tree species of the Marsh and are important to wildlife, particularly birds, for roosting and nesting. The groves of eucalyptus on Joice and Grizzly Islands, which are heron and egret rookeries, are particularly critical.

Policies

1. The diversity of habitats in the Suisun Marsh and surrounding upland areas should be preserved and enhanced wherever possible to maintain the unique wildlife resource.

2. The Marsh waterways, managed wetlands, tidal marshes, seasonal marshes, and lowland grasslands are critical habitats for marsh-related wildlife and are essential to the integrity of the Suisun Marsh. Therefore, these habitats deserve special protection.

3. Existing uses should continue in the upland grasslands and cultivated areas surrounding the critical habitats of the Suisun Marsh in order to protect the Marsh and preserve valuable marsh-related wildlife habitats. Where feasible, the value of the upland grasslands and cultivated lands as habitat for marsh-related wildlife should be enhanced.

4. The eucalyptus groves in and around the Marsh, particularly those on Joice and Grizzly Islands, should not be disturbed.

Amended November 2007

Egret rookery on Joice Island

WATER SUPPLY AND QUALITY

The Suisun Marsh is located where the salt water of the Pacific Ocean and the fresh water of the Sacramento and San Joaquin River Delta meet and mix. Because of its location, it provides a transition between salt and fresh water habitats which creates the unique diversity of fish and wildlife habitats characteristic of a brackish marsh. Water quality in the Marsh today is generally adequate, in terms of salinity, turbidity, temperature, and pollution levels. The salinity level, however, is almost totally dependent upon the amount of fresh water flowing in from the Delta, since it is this inflow that limits the intrusion of saline ocean waters.

Numerous upstream storage facilities, together with diversions of water from the Delta and the tributary streams of the Delta, have substantially reduced the amount of fresh water flowing into the Delta with a resultant increase in salinity intrusion into the Marsh and Delta. The construction of the proposed John F. Baldwin-Stockton Ship Channel would also increase salinity intrusion. Future changes: in land use in the watershed of the Suisun Marsh may also affect water quality through changes in turbidity, temperature or pollution levels.

Findings

1. The diversity of valuable fish and wildlife habitats in the Suisun Marsh is unique and is largely determined by the present quality of the Marsh waters. Water quality in the Marsh, in turn, depends on four major factors: pollution, temperature, turbidity, and salinity.

2. Today the most important factor in Marsh water quality is salinity. Slough salinities are presently determined by fresh water inflow, which dilutes the saltwater carried into the Marsh by tidal action from the ocean. The most important source of fresh water inflow to the Suisun Marsh is the outflow from the Sacramento-San Joaquin River Delta. Other sources of fresh water to the Marsh are groundwater, wastewater discharge, and surface runoff from the Marsh watershed.

3. Dilution of salt water from the ocean takes place gradually over the length of the San Francisco Bay system, forming a salinity gradient which differs according to the amount of fresh water inflow. The latter in turn varies with seasonal precipitation in the Central Valley and the Sierra Nevada, and with upstream diversions and storage. Consequently, salinities in the Marsh vary both seasonally and geographically. These salinity variations in the Marsh are essential to maintaining the existing unique diversity of fish and wildlife.

4. Water quality, at the levels required in existing salinity standards, in the Suisun Marsh is presently adequate to support the desired waterfowl food plants, such as alkali bulrush, brass buttons, and fat hen. If the waters of the bays and sloughs were to become substantially more saline, and if the more saline water were used to flood the managed wetlands, then the soils of the managed wetlands and the tidal marsh will become more saline. This will limit the distribution and abundance of important waterfowl food plants and ultimately reduce the wetland diversity and the capability of the Marsh to support wintering waterfowl.

5. The Marsh sloughs now support a large population of Neomysis shrimp, which is the principal food of juvenile striped bass and other fishes in the Marsh and Delta region. Any increase in the salinity of slough waters will reduce the Neomysis population. This in turn, would have a direct adverse effect on the fish, particularly the striped bass, that depend on it for food.

6. Between the turn of the century and 1975, "normal year" Delta outflow was reduced by nearly 50 percent through diversions from the Sacramento and San Joaquin Rivers and their tributaries by Federal, State, and local governments for agricultural, municipal, and industrial uses. Substantially increased diversions are even now underway, and still further increases are planned by the Bureau of Reclamation, as part of the Central Valley Project, and by the State Department of Water Resources, as part of the State Water Project.

7. Further substantial diversions of fresh water from the Sacramento River will allow water with a higher salt content to intrude into the Suisun Marsh and will allow the saline water to remain in the Marsh for a longer period of time. Moreover, the seasonal variation in the fresh water inflow and flushing action, both of which tend to reduce the impact of salinity intrusion, will be reduced. If constructed, the proposed John F. Baldwin-Stockton Ship Channel would also increase salinity intrusion into the Marsh.

8. Mitigation measures, including other sources of fresh water inflow to the Marsh, could possibly reduce or eliminate the adverse impacts of increased salinity intrusion into the Marsh that would otherwise result from substantial additional diversions of Sacramento River water or the construction of the Baldwin Ship Channel. Both salinity intrusion and mitigation measures are under study by a variety of agencies, including the Department of Water Resources, Department of Fish and Game, U.S. Fish and Wildlife Service, the U.S. Bureau of Reclamation, and the U.S. Army Corps of Engineers. At present, however, the extent of potential salinity intrusion is unknown, and the feasibility of any mitigation measures is unproven.

9. The State Water Resources Control Board in its Delta Decision, and the Environmental Protection Agency and the Regional Water Quality Control Board in the Water Quality Control Plan for the San Francisco Bay Basin, have set water and soil salinity standards for the Marsh. In establishing these standards, it was recognized that inadequate information was available on the impacts of future diversions of fresh water from the Delta. Consequently, these standards are designed to protect the Delta and the Suisun Marsh until an alternate supply is provided.

10. Assuring that sufficient quantities of fresh water will be available to the Marsh to meet the standards and marsh management requirements is as important as determining appropriate water quality standards for the Marsh. The Federal Government, through the Bureau of Reclamation's Central Valley Project, controls substantial amounts of water that would otherwise flow through the Delta. To date, the Bureau has not agreed to meet Delta Water quality standards if doing so will conflict with its ability to meet either existing or future contractual commitments for exporting water. Recent court cases indicate that the State may not be able to control the Bureau's operations, and Congressional action may therefore be necessary if water quality in the Delta and Suisun Marsh is to be protected.

11. Several proposed fresh water import projects in the Suisun-Fairfield area may be able to provide fresh water for controlled release into the Marsh. However, all these projects propose to import water from the Sacramento River, so that an increase in fresh water flowing to the Marsh from import projects could mean a reduction in the amount of fresh water inflow to the Marsh directly from the Delta via Montezuma and Suisun Sloughs. Thus, import projects of this nature represent redistributions of water rather than net importations.

12. The Fairfield-Suisun groundwater basin drains into the Marsh by subsurface flow and provides fresh water mixing and flushing action. It is recharged with fresh water runoff from the watershed by percolation on the Suisun Valley floor and along the stream channels. Any disruption or impedance of runoff and streamflow such as might occur from stream channelization or further upstream diversions within the watershed may adversely affect the function of the groundwater basins and their relationship with the Marsh. Additionally, any substantial removal of groundwater by pumping or subsurface drainage could interrupt natural subsurface discharges into the fresh water aquifers.

13. Waste water flowing into the Suisun Marsh area that can affect water quality comes from four principal sources: municipal sewage treatment plants, industrial discharges, agricultural return, and stormwater runoff from the watershed. The present level of wastewater discharge to the Suisun Marsh does not appear to have seriously affected the ability of the Marsh to support desired fish and wildlife species.

14. The existing level of turbidity in the Marsh sloughs and bays is an important element of water quality in the Marsh. Changes in the amount of sediments in the water could have adverse effects on fish and wildlife populations. Increased sedimentation caused by soil erosion into tributary streams in the watershed would increase turbidity and reduce light penetration into the water. This could be detrimental to phytoplankton populations which form the basis of the aquatic food chain. Conversely, if turbidity were substantially reduced, for example by major diversions of the sediment-bearing waters of the Sacramento River, light penetration would be increased. This would allow excessive growth of photosynthetic organisms, which would deplete the available supply of dissolved oxygen. The reduction in oxygen could possibly suffocate other aquatic life in the immediate area.

15. A moderate water temperature is important to the maintenance of the high quality aquatic habitat in the Marsh sloughs and bays. Significant increases in water temperature due to thermal discharge in the Marsh or adjacent water in the future could result in serious adverse effects on the Neomysis shrimp populations.

16. Accidental spills of toxicants into the waters of Suisun Bay or the Marsh from a tanker, pipeline, or shoreline facility could have serious adverse impacts on water quality. Because existing information on the behavior and effects of spills of toxic and hazardous materials in the Marsh area is extremely limited, it is presently impossible to assess adequately the threat to the Marsh from such spills. However a sizable spill could cause extensive damage if it reached the Marsh by destroying migrating or resident fish and wildlife, disrupting spawning, destroying habitats, and reducing or destroying plankton and vegetation. Although spills of insoluble materials can be contained if adequate spill control methods are available and correctly implemented, spills of soluble materials are of particular concern because they are impossible to contain. Because of

the normal movement of water through Montezuma Slough from its entrance near Collinsville, any major spill in the area of Collinsville could have a serious impact on a larger area of the Marsh.

17. There are proposals for development of industrial facilities upstream from the Marsh in the Montezuma Hills area between Collinsville and Rio Vista. If developed, these facilities will significantly increase the amount of ship traffic in the Carquinez Strait, the Suisun Bay Channel, and the Sacramento River. They would also significantly increase the amount of toxic and hazardous materials being shipped by tanker and barge past the Marsh, and being loaded and unloaded upstream. Under most conditions, prevailing currents from the Rio Vista and Antioch area would tend to carry any spilled materials into the Suisun Bay and the Suisun Marsh.

Policies

1. Neither the extent of increased salinity intrusion nor the potential for violation of State and Federal water quality standards due to the combined effect of the proposed John F. Baldwin Ship Channel and increased diversions for the State Water Project and Central Valley project is now known. Until the combined, as well as individual, environmental impacts are known, and mitigation assured for adverse impacts, (a) the channel should not be dredged, and (b) there should be no increase in diversions by State or Federal Governments that would cause violations of existing Delta Decision or Basin Plan standards.

2. Adequate supplies of fresh water are essential to the maintenance of water quality in the Suisun Marsh. Therefore, the State should have the authority to require the Bureau of Reclamation to comply with State and Federal water quality standards for the Delta and the Marsh. This should be accomplished through Federal legislation if necessary.

3. Basin Plan water quality standards should be reviewed as better data becomes available, and revised as necessary to protect the Marsh.

4. Water quality standards in the Marsh should be met by maintaining adequate inflows from the Delta. Fresh water from projects designed to import or redistribute fresh water in the Marsh, and therefore to compensate for reduced inflow from the Delta should not be used unless it is established that the importation or redistribution of water will not have a significant adverse impact on the Marsh.

5. Projects designed to import or redistribute the fresh water in the Marsh for salinity control should be planned carefully so that the expected benefits are realized. Furthermore, any proposed import project should be studied to determine if the project would adversely affect the Marsh by encouraging urban and industrial growth in the Marsh area. No import project should be constructed if the adverse environmental impacts of growth on the Marsh would outweigh the possible beneficial impacts of salinity control.

6. To prevent crop damage in some areas, the withdrawal of groundwater from the underground aquifers surrounding the Marsh may be desirable. Withdrawal should not be so extensive as to allow the salt water of the Marsh to intrude into fresh water aquifers, or to disrupt the natural subsurface flow of groundwater into the Marsh.

7. Disruption or impediments to runoff and stream flow in the Suisun Marsh watershed should not be permitted if it would result in adverse effects on the quality of water entering the Marsh. Riparian vegetation in the immediate Suisun Marsh watershed should be preserved, and stream modification permitted only if it is necessary to ensure the protection of life and existing structures from floods. Only the minimum amount of modification necessary should be allowed in such cases. Local runoff, erosion and sediment control ordinances should be established to protect the Marsh from potential adverse impacts.

8. There are several proposals to use local or imported municipal wastewater for Marsh enhancement, as well as for agricultural irrigation in the Fairfield-Suisun area. Careful monitoring of any treated or untreated discharges from municipal, agricultural, and industrial sources should be carried out to assure maintenance of adequate water quality in the Marsh.

9. Existing and new agricultural drainage systems should meet all applicable State and Federal water quality standards. Moreover, all discharge permits for agricultural drains, such as the San Luis Drain, should be based on a thorough study of the effects of the outflow, flushing, and mixing patterns in the Suisun Bay and Suisun Marsh, to guarantee that no adverse impact on the Marsh results from any discharge.

10. The development of industrial facilities adjacent to or upstream from the Marsh should not be permitted if they have the potential to cause significant adverse impacts on the water quality of the Suisun Marsh. Activities that could significantly alter the temperature, salinity or turbidity of the water should be prohibited. Industrial facilities that will increase the potential for spills of toxic and hazardous materials should not be permitted unless it is established that spills of such materials will not represent a significant threat to the Marsh.

Amended November 2007

NATURAL GAS RESOURCES

Several thousand feet below the tidal marshes, managed wetlands, sloughs and bays of the Suisun Marsh are geologic formations that contain trapped accumulation of natural gas. These formations and the accumulated gas constitute the Suisun Marsh gas fields. Gas has been extracted from the Suisun fields since their discovery in 1938. However, due to the high demands for natural gas as a fuel and the limited nature of the resource, the fields are expected to be completely depleted by 2000. After the depletion of the fields, the remaining geologic formations may be suitable for the underground storage of natural gas extracted from other fields and transported to the Bay Area by pipeline or tanker.

Findings

1. Four of the seven known gas fields in the Suisun Marsh are presently being used for gas production. They are located on Grizzly Island, Ryer Island, Van Sickle Island, and Kirby Hill. In 1972, there was a total of 27 producing wells in these fields.

2. The Suisun Marsh gas fields yield relatively high quality natural gas containing few impurities and made up almost entirely of hydrocarbons such as methane, ethane, butane, and propane. These hydrocarbons are clean-burning, highly flexible, and efficient sources of energy and chemical feedstocks. They are relatively insoluble in water, dissipate quickly in the air, and are highly flammable at certain concentrations in the air.

3. Because natural gas is desirable as an energy source and a chemical feedstock, there has been rapid use of all identified natural gas fields. The California Public Utilities Commission has estimated that the Suisun gas fields will be completely depleted within the next 25 to 30 years.

4. Facilities for the long-term storage of natural gas are necessary because of the seasonal variation in gas supply and demand. The most common storage method involves the injection and storage of natural gas in naturally occurring underground geologic reservoir formations. The best geologic formation for this purpose is an "anticline trap" which consists of highly permeable reservoir rock and thick impermeable cap rock sealing the reservoir. Anticline formations such as this are found in the Suisun Marsh fields.

5. The California Division of Oil and Gas requires permits for all gas (as well as oil and geothermal) wells drilled in the State, whether for the extraction of mineral resources, or the injection for storage of gas (or oil or geothermal power).

6. Natural gas is presently transported into and out of the Suisun Marsh through underground pipeline systems. The major adverse impacts of an underground pipeline on the Marsh are generally short-term impacts that occur at the time of construction. Some construction methods have more adverse impacts than others.

7. Natural gas can also be transported and stored in liquid form. Storage and transportation of liquified natural gas (LNG) is hazardous because the extremely low temperature of the liquid gas makes it difficult to handle. LNG must be handled and stored with extreme care, however, as it is highly explosive.

Policies

1. Transportation of natural gas by underground pipeline is the most economical and safe method of gas transportation in the Suisun Marsh area. Future gas pipelines should be permitted if they are consistent with the Suisun Marsh Protection Plan and if the design and construction meet the following standards:

    (a) Existing pipeline systems are utilized to the maximum extent feasible.

    (b) The pipeline design meets all applicable safety standards of the Office of Pipeline Safety Operations (OPSO) and other regulatory agencies.

    (c) The pipeline route avoids tidal marshes and managed wetlands wherever possible and, if that is not possible, the route crosses as little marsh or managed wetland as possible.

    (d) Wide track or amphibious construction equipment is used in tidal marsh or managed wetland areas. Pads or mats are used as needed to prevent any construction equipment from sinking into the soft marsh muds and damaging the marsh plants.

    (e) The "trench and push" construction method is used in all tidal marsh and managed wetland areas where feasible, so that the construction zone is kept as small as possible and the minimum amount of heavy equipment passes through the marsh or wetland area.

    (f) Prior to any pipeline construction or related activities in the Marsh, the contractors consult with the Department of Fish and Game to determine at what time such construction or related activities should be conducted so as to create the least possible adverse impact on breeding, migration, or other fish and wildlife activities.

    (g) Prior to any underground pipeline construction in the Marsh, the contractors consult with the Solano County Mosquito Abatement District to ensure existing recirculation water ditches are not blocked and levees are adequately repaired after pipeline construction, or that effective mosquito control measures are maintained.

    (h) At slough, mudflat and bay crossings of gas pipelines, the trench is dredged in a manner that minimizes turbidity and prevents interference of the dredging operation with fish or wildlife.

    (i) A regular surface and aerial inspection of the pipeline route is carried out as required by OPSO.

2. If additional gas wells or ancillary facilities are required for gas exploration, production, or injection, the drilling should be accomplished with the following safeguards:

    (a) Drilling operations conform to the regulations of the California Division of Oil and Gas designed to prevent damage to natural resources.

    (b) The drilling operation is confined to as small an area as possible and does not irreversibly damage unique vegetation or fish and wildlife habitats.

(c) After drilling is complete, all drilling muds, waterwaste, and any other fluids are removed entirely from the site and disposed of in a manner that does not adversely affect the Marsh.

(d) All buildings, tanks "christmas trees" or other facilities related to the production or storage of natural gas do not result in the permanent loss of water surface in the Marsh.

3. Construction and drilling in tidal marsh and managed wetland areas should occur only during the dry months of the years (generally May through August) when these activities would not disturb wintering waterfowl.

4. If gas wells are abandoned, they should be sealed in accordance with Division of Oil and Gas regulations; the drilling or production facilities should be removed; and the surface area should be revegetated with native vegetation within one growing season after abandonment.

5. Storage of natural gas in depleted gas reservoirs is a reasonable use of the resource and should be permitted. Storage facilities should meet all safety standards of the Division of Oil and Gas.

6. Because the Suisun Marsh offers both natural gas and depleted gas fields suitable for gas storage, and because it is close to the urban Bay Area and the proposed waterfront industrial area on the Sacramento River, gas will probably continue to be transported out of, into, and around the Marsh. All gas transportation into and out of the Marsh is now by underground pipeline systems. If other types of systems for the transport or storage of liquified natural gas (LNG) are proposed for the Suisun Marsh area, a detailed investigation of the hazards and impacts of LNG facilities should be carried out prior to approval of the facilities.

Gas well on Grizzly Island

UTILITIES, FACILITIES AND TRANSPORTATION

Construction of utilities, facilities, and transportation systems in and immediately adjacent to the Suisun Marsh can (1) disrupt the Marsh ecosystem at the time of construction; (2) have lasting effects on wildlife by forming barriers and obstacles to their movement and flight patterns; and (3) stimulate urban development by providing services that are a prerequisite for such development.

Findings

1. Because the Suisun Marsh consists of a large expanse of relatively flat terrain, it is attractive for utility routes (pipelines, wires, and cables) and transportation facilities (roads and highways, railroads, and air transport).

    (a) Electric transmission lines carrying power for regional needs pass along the edges of the Suisun Marsh. Local distribution lines extend into the Marsh providing electricity to duck clubs and farms. Above-ground power lines in or immediately adjacent to the Marsh are hazards to marsh birds, which may collide with them during periods of low visibility. Large birds of prey are also susceptible to electrocution by power lines having less than six feet between wires. Power lines may alter flight patterns and deter landing of waterfowl.

    (b) Above-ground telephone lines constructed in and immediately adjacent to the Marsh also can be hazardous to birds during periods of low visibility. At present, however, telephone lines only extend along the few roads in the Marsh to serve farms and duck clubs in the wetlands.

    (c) Natural gas and petroleum products are now transported from and through the Suisun Marsh in underground bulk pipelines. The major impacts of undergrounding pipelines in the Marsh, as with the construction and installation of other underground utilities (such as wires and cables), are generally short-term impacts that occur at the time of construction. Proper construction and installation methods, and proper timing of construction can reduce these impacts. Underground pipelines have less impact on terrestrial wildlife than pipelines at ground level.

    (d) Electric power distribution lines, natural gas distribution pipelines, domestic water pipeline mains, and sewage pipelines (sewers) can stimulate urban development by providing services that are a prerequisite for such development. Of these, only electric power distribution lines are now located in the Marsh and immediate upland areas.

    (e) Highways and roads, especially those bordered by chainlink fences, form barriers to movement of terrestrial Marsh wildlife. In addition, traffic on highways and roads creates intermittent noises which may alarm Marsh wildlife, although the actual effects of noise upon wildlife have not been determined.

    (f) Railroad tracks, especially those on raised railbeds, form barriers to movement of some terrestrial Marsh wildlife. In wetland areas, construction of rail lines on trestles allows free passage of water under the rail line and reduces impact on wildlife movement.

2. The Fairfield Subregional Waste Water Treatment Plant, which is planned to begin operation in 1976, will process all sewage from Fairfield, Suisun City, Travis Air Force Base, and Cordelia. Under the conditions of the federal grant, which is administered by the Environmental Protection Agency, for construction of the treatment plant, use of the plant by any residential, commercial, or industrial development located within the "Suisun Marsh Protection Zone as that zone may be defined by the California Legislature" is prohibited.

3. Because of the high water table and impervious clay soils in the wetlands, septic systems used by waterfowl hunting clubs may be outdated. The Solano County Department of Resource Management has determined that waste from some waterfowl hunting club septic systems is reaching ground and surface water in the Marsh. The Department of Resource Management responds to public complaints regarding existing systems and requires all remodeled and newly constructed waterfowl hunting clubs to install sewage holding tanks only and to have the tanks pumped out by an approved service agent.

4. There are three solid waste disposal sites in the Suisun Marsh area: one operated by Pacific Reclamation and Disposal, Inc.; one operated by the Solano Garbage Company; and one operated by Material Disposal Corporation.

   Although solid waste disposal facilities generally handle dry waste products, the Pacific Reclamation site handles liquid, industrial, hazardous, and special wastes. This facility is one of only three Class I waste disposal sites capable of receiving toxic and hazardous materials in northern California and is an important industrial disposal facility. Although the site is located within a drainage way leading into Suisun Marsh, protection to the Marsh is provided by a dam meeting the requirements of the Regional Water Quality Control Board and the Division of Dam Safety.

   The second solid waste disposal site, a more conventional Class II facility (Class II sites are used for disposal of Class II materials, which include non-toxic, chemically and biologically degradable materials, and require fewer precautions against geologic, flood, and seismic safety hazards than Class I sites), is operated by Solano Garbage Company on an approximately 70-acre parcel adjacent to Hill Slough. It has a remaining capacity that will last approximately 20 years. Expansion of the facility to an adjacent 150 acre parcel would involve removal of upland grassland, which is an important habitat for Marsh-related wildlife adjacent to Hill Slough.

   A third solid waste site was operated in the past by Material Disposal Corporation on Wheeler Island at Honker Bay. Any continued operation or expansion of this facility would involve fill in tidal marsh.

5. The solid waste management plan being prepared by Solano County proposed that solid waste of the County be gradually centralized at a new sanitary landfill site near Fairfield. Three alternative sites are proposed: (a) Expansion of the existing Solano Garbage Company site; (b) a new site in the Potrero Hills; and (c) a new site in Jameson Canyon west of Suisun Marsh. All the alternative sites have sensitive ecological relationships with the Marsh: expansion of the Solano Garbage Company site would require removal of upland grassland, important habitat to Marsh-related wildlife at the head of Hill Slough; construction of a new facility in the Potrero Hills would disrupt an important "island" of upland grassland wildlife habitat; and development of a facility

in Jameson Canyon could affect Jameson Canyon Creek, the lower stretches of which are important Marsh related riparian habitat. Construction and operation of material and energy recovery facilities, which are planned at all three sites, would bring industrial facilities into these habitat areas.

6. Suisun Channel is designated as a navigable channel and is maintained by the U.S. Army Corps of Engineers. The shallow draft channel extends from the mouth of Montezuma Slough to its terminus at Suisun City and is used for shipping oil to the Sheldon Oil Company at Suisun City and for possible barging of jet fuel to Travis Air Force Base in emergency situations.

Policies

1. In the Suisun Marsh and upland areas necessary to protect the Marsh, improvements to public utility facilities should follow these planning guidelines:

   (a) New electric power transmission utility corridors should be located at least one-half mile from the edge of the Marsh. New transmission lines, whether adjacent to the Marsh or within existing utility corridors, should be constructed so that all wires are at least six feet apart.

   (b) Urban utilities and public services (e.g. natural gas lines, electric lines for local power distribution, domestic water mains, and sewers) should be allowed to extend into the Suisun Marsh and the adjacent upland area necessary to protect the Marsh, only to serve existing uses and other uses consistent with protection of the Marsh, such as agriculture. However, utilities in the secondary management area necessary for the operation of water-related industry within the area designated for such use in the Suisun Marsh Protection Plan at Collinsville would be permissible.

   (c) Within the Marsh, new electric lines for local distribution should be installed underground unless undergrounding would have a greater adverse environmental affect on the Marsh than above-ground construction, or the cost of underground installation would be so expensive as to preclude service. Any distribution line necessary to be constructed above ground should have all wires at least six feet apart.

   (d) New telephone lines installed in the Marsh and within one-half mile of the Marsh should be buried underground. Existing telephone lines in the Marsh should be buried at the time of line repair. All new telephone cables routed through the Suisun Marsh area should be buried, and the alignment should avoid wetland areas whenever possible.

   (e) New roadways (highways, primary and secondary roads) and rail lines that form barriers to movement of terrestrial wildlife should not be constructed in the Suisun Marsh or in adjacent uplands necessary to protect the Marsh except where such roadways and rail lines are necessary in the secondary management area for the operation of water-related industry and port uses within the area designated as a water-related industry reserve in the Protection Plan at

Collinsville. Rail access to serve the water-related industry reserve area may be permitted within the existing Sacramento Northern Railroad right-of-way or along the east side of the Marsh, whichever route would result in the least disturbance to wetlands and wildlife. Wherever possible, rail access to the Sacramento River and through the area designated as a water-related industrial reserve area should be located above the 10-foot contour in order to avoid adverse impacts to wetlands. Whenever the reconstructed line would pass through wetland areas, it should be constructed on trestles.

2. In the Marsh, only existing uses or uses otherwise consistent with the Suisun Marsh Protection Plan should be allowed to use the treatment capacity of the Fairfield Subregional Waste Water Treatment Plant.

3. Underground pipelines, wires and cables should be permitted in the Suisun Marsh if no alternative route is feasible and they are designed and constructed to meet the following standards:

   (a) Installation of pipes, wires, and cables (particularly local service utilities) are located within existing road rights-of-way whenever possible.

   (b) All pipelines passing through the Marsh meet Pipeline Safety Regulations of the U.S. Department of Transportation regarding pipe thickness, pressure limiting devices, emergency shut-down valves and other safety design criteria.

   (c) Whenever construction occurs within the wetlands, it is confined to the dry months (generally mid-April through mid-October) to minimize disturbance of wetland vegetation, wintering migratory waterfowl, other water-associated birds, and nesting resident birds.

   (d) Wide-track or amphibious construction equipment is used to reduce the bearing weight of the equipment unless pads are laid on the wetland area to support the heavy machinery and to prevent it from sinking into the soft marsh soil. Equipment movement to the construction site within the Marsh is limited to roads in the immediate vicinity of the pipeline, wire, or cable being installed to minimize disruption of Marsh wildlife habitat. The construction site is well defined and clearly marked so that workers do not disturb adjacent Marsh areas.

   (e) When a trench is cut to install a pipe, wire, or cable, excavation is only slightly wider than the utility line to be buried to minimize wetland disturbance.

   (f) When pipelines only are being installed across wetlands, the "trench and push" method of construction is employed. This construction method, the least damaging to the wetlands because it avoids the need for heavy equipment alongside the trench to install the pipe, involves filling the excavated trench with water and pushing or pulling the assembled pipe through the Marsh trench.

   Recent pipeline installation in the Suisun Marsh, conducted under a BCDC permit, indicates that this is a practical method in the Marsh.

(g) Tidal marsh and managed wetlands disturbed during pipeline, wire, or cable construction will generally revegetate naturally within one growing season if the top layer of soil and vegetation is stockpiled when the trench is first dug and replaced on top of the backfilled trench to facilitate revegetation. If a completed trench is not revegetated within one growing season in a managed wetland, the disturbed area must be reseeded with appropriate native plant seed.

(h) In water areas (bays and sloughs), dredging and pipe and cable installation is scheduled so as to avoid major fish migrations.

4. All plans for construction within the Marsh should be reviewed by the Department of Fish and Game to further assure that construction methods and timing will have a minimal impact on Marsh flora and fauna.

5. Because septic systems may not function properly in the wetland area, the Solano County Department of Resource Management should continue to work with landowners to phase out existing septic systems in the wetlands and require new systems that would properly dispose of wastes as required by the Solano County Department of Resource Management and the Regional Water Quality Control Board.

6. To protect the Marsh from potential accidental drainage of toxic materials, any future expansion of the Pacific Reclamation and Disposal, Inc. facility should meet all requirements of the Regional Water Quality Control Board, and any future dam construction to contain waste material should meet all requirements of appropriate regulatory agencies, such as the Division of Dam Safety. Any future expansion, construction, or operation of the Pacific Reclamation facility outside the area currently under option should be away from the steep slopes of the hills that front directly on the Marsh.

7. The Solano Garbage Company should be permitted to continue its existing County approved operation until it reaches capacity. Expansion of this facility or development of a new site in the Potrero Hills for a central solid waste disposal facility would impact upland grassland areas, including the golden eagle nest site, which provide valuable habitat for Marsh-related wildlife. Therefore, development of these sites for solid waste use appears to be inconsistent with protection of the Marsh and should not be permitted unless it can be shown (1) that no other practical, reasonably accessible alternative site to Solano County is available and (2) that the construction and operation of such facilities would not have adverse ecological or aesthetic impacts on either the Marsh or adjacent uplands necessary for protection of the Marsh and Marsh-related wildlife. Development of a central solid waste disposal site in Jameson Canyon could be permitted if the development would not adversely affect the Jameson Canyon Creek or its riparian vegetation.

8. Material Disposal Company's debris disposal facility, which is currently not in operation, should not be permitted to resume functioning because its operation would involve fill in tidal marsh and is not compatible with preservation of the Marsh.

9. The Suisun Channel is used for access to boat repair yards in Suisun City and is available for barging of jet fuel to Travis Air Force Base if necessary. The Channel should continue to be maintained in conformance with existing project specifications, provided that channel dredging, as well as any other Marsh waterway dredging: (a) is for a

water-oriented use or other important public purpose; (b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board; and (c) important Marsh fisheries and wildlife and their habitat would be protected.

Dredged material proposed to be disposed in the Marsh should occur in non-tidal areas where the materials can be used beneficially to help restore, enhance or manage the Marsh consistent with policies of the Protection Plan.

Barging of jet fuel, a toxic substance, should only be carried out in emergency situations where fuel can not be adequately supplied by pipeline to Travis. The Air Force should prepare an accidental spill prevention and recovery plan.

10. Grizzly Island Road should be maintained by the State and Solano County on a cost sharing basis.

Amended November 2007

RECREATION AND ACCESS

The vast open expanse of the Suisun Marsh is the location of many recreational activities. The Marsh is well known for waterfowl hunting in California. In addition several other forms of recreation, including fishing, upland game hunting, and water sports, are also popular in the Marsh. Nevertheless, there are opportunities for a greater diversity and amount of public recreation in the Marsh.

The recreation values of the Marsh, particularly for duck hunting, have been a significant factor in its preservation. Private duck clubs and public agencies, such as the Department of Fish and Game, have made considerable contributions to the improvement of the Marsh habitats for waterfowl as well as other wildlife.

Findings

1. The Suisun Marsh is a major open-space resource of the San Francisco Bay region, and recreation is the major human use of the Suisun Marsh. A major attraction of the Marsh for recreational use is its undisturbed open-space character

2. Market hunting of waterfowl began in the Suisun Marsh in the late 1850s, and the first private waterfowl sport hunting clubs were established in the early 1880s. Demand for hunting opportunities has resulted in the protection from urban development of tens of thousands of acres of marsh habitat. Generations of hunting club owners and members have worked to maintain the area's habitat value and to protect the natural resources of the Marsh. Today, waterfowl hunting is the major recreational activity in the Suisun Marsh, occurring from late October until late January each year, though the private waterfowl hunting clubs and public wildlife areas of the marsh are also used for a wide variety of other recreational activities, including upland game hunting, fishing, dog training, boating, hiking, photography, education, nature study, and wildlife viewing.

3. The demand for existing recreational uses of the Suisun Marsh is presently high and will probably increase in the future. There is also a high demand for water sports and passive recreational activities, such as nature walks, picnicking, and sightseeing. Participation in these activities would increase if better facilities were provided.

4. Approximately 15,400 acres of managed wetlands are publicly owned in the Suisun Marsh. Public wildlife areas of the Suisun Marsh are managed to meet multiple objectives, including enhancing wildlife habitat, as well as providing public recreational opportunities such as waterfowl hunting, fishing, wildlife viewing and hiking. Over time, waterfowl hunting on public lands has decreased while other types of recreation (including fishing and nonconsumptive recreational uses, such as wildlife viewing) have greatly increased.

5. Fishing accounts for nearly as much recreational use of the Marsh as waterfowl hunting. Public boat launches exist at Suisun City and Belden's Landing. Island Slough and Grizzly Island Wildlife Area both provide public fishing piers. Fishing is also allowed at unimproved sites in much of the publicly owned areas of the Marsh. Fishing at unimproved sites is accessed primarily on foot from designated parking areas. Some frequently used fishing sites may be dangerous because they are located on narrow roads and place fishermen in close proximity to passing automobiles.

6. Due to the diversity of vegetation and fish and wildlife species the Suisun Marsh has high potential for scientific and educational use.

7. The Solano County Park Department has proposed parks for two sites in the Suisun Marsh: at Beldon's Landing on Montezuma Slough and on Hill Slough. These would increase opportunities for public access and recreation activities in the Marsh.

Policies

1. Continued recreational use of privately-owned managed wetlands should be encouraged. Additional land should be acquired within the Suisun Marsh to provide for increased public recreational use and additional refuge areas for waterfowl during the hunting season. Acquisition priority should be given to those lands not now operated as managed wetlands.

2. Land should also be purchased for public recreation and access to the Marsh for such uses as fishing boat launching and nature study. These areas should be located on the outer portions of the Marsh near the population centers and easily accessible from existing roads. Improvements for public use should be consistent with protection of wildlife resources.

3. Public agencies acquiring land in the marsh for public access and recreational use should provide for a balance of recreational needs by expanding and diversifying opportunities for activities such as bird watching, picnicking, hiking, and nature study.

4. Agencies administering land acquired for public access and recreational use should be responsible for maintaining the areas and controlling their use. Signing on roads leading into the Marsh and maintained litter receptacles at major public use areas should be provided by the appropriate local or State agency to prevent littering and vandalism to public and private property.

5. Recreational activities that could result in adverse impacts to the environment or aesthetic qualities of the Suisun Marsh should not be permitted. Levels of use should also be monitored to insure that their intensity is compatible with other recreation activities and with protection of the Marsh environment. For example, boat speeds and excessive noise should be controlled and activities such as water skiing and naval training exercises should be kept at an acceptable level.

Amended November 2007

Fishing on Joice Island

WATER-RELATED INDUSTRY

The San Francisco Bay Plan (1969) designated priority areas for use by water-related industries around the Bay. Four of the sites are located adjacent to the Suisun Marsh. Some of them have high potential for water-related industrial use. Other areas are unlikely to provide good locations for water-related industry and also have significant environmental values related to the Suisun Marsh.

Findings

1. Water-related industry and ports are of great value to the regional economy of the San Francisco Bay Area. Although the future demand for new water-related industries is not expected to be great, the supply of deep-draft sites suitable for water-related industry use in the Bay Area is limited. The San Francisco Bay Plan reserves two deep-draft water-related industry and port priority use areas adjacent to the Suisun Marsh. Most of the Benicia site, which is located on the southwestern edge of the Marsh, is already developed. The Collinsville site on the southeastern side of the Marsh is the largest vacant site with deep-water access within the Bay Area and therefore is important in the future development of water-related industry and port uses.

2. Water-related industrial sites in the Bay Area with shallow-draft access are not as scarce as deep-draft sites. In addition, the demand for shallow-draft sites is presently low, although technological advances could increase demand in the future. Industrial demand for the Bay Plan shallow-draft water-related industry sites adjacent to the Suisun Marsh–the Suisun site to the southeast of Suisun City and a site in the southwest Potrero Hills–would probably be limited to firms extracting natural resources in the immediate area. There is no indication that such industries will locate in the Suisun Marsh area in the foreseeable future.

3. The Suisun site has several natural constraints that restrict its suitability for industrial development. The site presents foundation problems due to its location on Bay mud, and it lies within the 100-year flood plain. In addition the Suisun site is relatively remote from major shipping channels and has poor land access with no railroad or major highway. On the other hand, the site has high Marsh related environmental values because it is composed of lowland grassland and seasonal marsh, both of which are extremely valuable habitats for Marsh wildlife.

4. Most of the Potrero Hills site is physically suitable for industrial development. However, like the Suisun site, the Potrero Hills site is fairly remote from major shipping channels, and land access to land portions of the site is restricted because most of the shoreline consists of tidal marsh. Industrial development in this area would disturb and displace habitats important to Marsh-related wildlife and would also detract from the value of the Potrero Hills as a visual feature of the Suisun Marsh.

5. The eastern portion of the Collinsville site above the 10-foot contour line is physically suitable for industrial development. The western lowland half of the site would present foundation problems for development (due to its location on Bay mud), is within the 100-year flood plain, and includes large areas of seasonal marsh that are subject to annual inundation. In addition, this low-lying area comprises two habitats that are critical to Marsh wildlife-lowland grassland and seasonal marsh. The area is also a historic marsh and has potential for restoration by returning it to tidal action.

However, the southern portion of the low-lying area is adjacent to the deepwater shoreline and might be needed in the future to provide access to industrial facilities that may be located on the upland portion of the Collinsville site.

6. The Collinsville site extends approximately eight miles from the Sacramento River north to Little Honker Bay. However, because the cost of transporting materials from a dock to an industrial plant increases with the distance of the plant inland from the shoreline, it is unlikely that water-related industry would locate farther than four miles from the deep-draft shoreline access along the Sacramento River.

7. The Collinsville site is only a part of an extensive shoreline area fronting on deep water that extends from Collinsville to Rio Vista. This area, with approximately 12.5 lineal miles of deep water frontage, represents an important part of the total Bay Area inventory of water-related industrial sites. Solano County has prepared the Collinsville-Montezuma Hills Area Plan and Program for this area.

Policies

1. Future demand for the shallow-draft water-related industrial sites in the Suisun Marsh area is questionable. In addition, the Suisun and Potrero Hills sites present several physical constraints for industrial development and have considerable value as aesthetic and wildlife resources in the Suisun Marsh area. It is both unnecessary and undesirable to continue to designate these sites for industrial use and they should not be reserved for this purpose.

2. The Collinsville site is an important vacant deep water site for water-related industry within BCDC's jurisdiction. However, areas farther than four miles from the deep-draft shorelines on the Sacramento River are unlikely to be used for water-related industry. Therefore, these areas should not be reserved for this use.

3. The eastern portion of the Collinsville site, above the 10-foot contour line, presents no significant physical constraints for development and should be reserved for water-related industry and port use.

4. The western portion of the Collinsville site, below the 10-foot contour line, does present physical constraints for development and consists of critical Marsh-related wildlife habitats. Nevertheless, the southern part of this area, which fronts on deep water, has very high value for water-related industry and port use. The western boundary of the area to be reserved for water-related industry and port use should follow the 10-foot contour line south until it intersects the railroad right-of-way. The boundary should then follow the right-of-way south to the bench mark at Montezuma, and then run from the bench mark to a point on the shoreline 3,200 feet west of Bench Mark 3 located east of the Collinsville inlet. This provides 1,000 feet of undeveloped shoreline between the mouth of Montezuma Slough and any industrial or port activity.

   Reservation of the eastern portion of the site for water-related industry and port use notwithstanding, wetland restoration or enhancement of the area below the 10-foot contour line may occur provided that the restoration or enhancement program is carried out in a manner that will not preclude use of the deep water shoreline and area above the 10-foot contour line for water-related industry and port use. Specifically, any wetland

restoration or enhancement project should be designed so as not to restrict possible future development and operation of marine terminals and marine terminal berths on the deep water shoreline, and the movement of waterborne cargo, materials and products from the shoreline terminal to the upland portions of the site.

A program to prevent accidental spills of toxic and hazardous materials entering Montezuma Slough should be developed by industries constructing marine terminal facilities at Collinsville. Prior to the use of such facilities, equipment required to carry out the prevention program should be installed at the appropriate location at or adjacent to the mouth of Montezuma Slough.

5. The remaining areas of lowland grassland and seasonal marsh in the Collinsville site should be preserved and, whenever possible, enhanced or restored for their intrinsic value as Marsh-related wildlife habitat and to act as a buffer between the Suisun Marsh and industrial and port activities. There are several land uses that could occur in this area. The existing agricultural use–cattle grazing–could be continued. Portions of the area should also be restored to wetland status, either as tidal marsh or managed wetlands. Dredged materials may be used in any wetland enhancement or restoration program when such activity will be conducted without adverse environmental impacts on the Marsh.

6. The feasibility of establishing a special purpose district in the Collinsville-Rio Vista area to provide utilities and services to industries in that area and to function as a port authority should be investigated.

7. The Benicia industry site plays an important role in the regional economy and most of the site is already developed. It should continue to be reserved for water-related industry.

8. All future industrial development adjacent to the Suisun Marsh within areas reserved for water-related industry should conform to the following planning guidelines:

   (a) Industrial activities should not have the potential to cause significant adverse impacts on the Suisun Marsh. In particular, water quality should be maintained by ensuring that no hazardous or toxic materials could be introduced into the Marsh sloughs and by prohibiting activities that could alter the temperature salinity or turbidity of the water. Construction of necessary access routes across wetlands should result in the minimum possible disturbance to the ecosystems and wildlife. Pipelines should be installed using the procedures described in the Plan Policies on Utilities, Facilities, and Transportation. Conveyor belts and railroads should be constructed on trestles, except in situations such as along the western boundary of the Collinsville water-related industry area, where a railroad may be constructed on fill in order to provide a dike separating industrial facilities from wetlands.

   (b) The construction and development of any industrial facilities adjacent to and upstream from the Suisun Marsh should comply with the Plan Policies on Water Supply and Quality and all applicable State and Federal water and air quality standards.

(c) Industrial facilities should not be located directly adjacent to the Suisun Marsh. A buffer area should be provided to reduce adverse environmental impacts on the Marsh.

(d) Development of industrial sites should not result in the construction of physical barriers such as freeways, fences or exposed pipelines that impede the movement of wildlife. In addition, construction of very tall structures with which birds are prone to collide, especially during migrations and in bad weather, should be avoided. Industrial facilities adjacent to wildlife areas that deter the landing of waterfowl should also be avoided. However, the type, size, and location of structures that could be hazardous cannot now be predicted in advance. Therefore, decisions should be made on a case by case basis to ensure that structures in the vicinity of the Marsh are located and constructed to avoid, to the maximum extent feasible, interference with the flight patterns of waterfowl and other water-associated birds.

(e) Industry sites should be developed to allow the most efficient use of the shoreline. For example, in the Collinsville site, wharves constructed along the shoreline in the area reserved for water-related industry, in addition to any petroleum dock which may be needed, should be shared to the maximum extent feasible by industries locating in the water-related industry area.

(f) Storage of raw materials, fuel, or products should not be permitted at the shoreline on a permanent or long-term basis. The waterfront is too scarce and valuable to accommodate uses, such as storage, that could be located farther inland.

(g) Industrial facilities should be located and designed to avoid visual intrusion on the Suisun Marsh. Where sloping land is to be used for industrial development, it should be terraced, rather than leveled, and soil erosion and storm water runoff should be controlled. Buildings should not be highly visible against the skyline, should have a low profile, be well designed and unobtrusive in appearance, and use colors and materials compatible with the surrounding landscapes. Appropriate landscaping should be used to reduce the impact of industrial structures on views from the Suisun Marsh.

(h) The industrial waterfront is attractive and interesting to many people and public access to the shoreline should be provided wherever feasible, unless it will result in interference with industrial activities or hazards to the public. Public access to exceptional natural features within industrial areas should also be provided wherever feasible.

Amended April 1995

LAND USE AND MARSH MANAGEMENT

The tidal marshes, managed wetlands, seasonal marshes, and the lowland grasslands of the Suisun Marsh represent a vital resource for many forms of Marsh wildlife. They play a particularly important role in providing wintering habitat for waterfowl of the Pacific Flyway and also constitute the habitat of many year-round residents, including shorebirds, wading birds, raptors, amphibians, rodents, and other mammals.

Because of their critical importance to Marsh wildlife, these areas should be included in a primary management area. Within this area, existing land uses should continue, and land and water areas should be managed so as to achieve the following objectives:

- Preservation and enhancement of Marsh habitat
- Provision of habitat attractive to waterfowl
- Improvement of water distribution and levee systems
- Encouragement of agricultural and grazing practices consistent with wildlife use, waterfowl hunting, and elimination of mosquito breeding
- Restoration of historic wetlands

Surrounding the primary management area is an area comprising upland grasslands and cultivated lands. The upland grasslands and cultivated lands provide habitat for Marsh-related wildlife, but more importantly, by their location and existing uses, they insulate the habitats in the primary management area from the adverse impacts of both urban development and other upland land uses and practices incompatible with Marsh preservation.

The upland grasslands and cultivated lands surrounding the primary management area should therefore be included in a secondary management area. The function of the secondary management area should be to act as a buffer area to insulate the habitats within the primary management area. Within the secondary management area, existing grazing and agricultural uses should continue, and agricultural practices favoring wildlife use and habitat enhancement should be encouraged.

The watershed of the Suisun Marsh is also directly related to the protection of the aquatic and wildlife resources of the Marsh. In particular, land uses in the watershed can affect water quality and supply. For example, toxic and hazardous materials introduced into streams entering the Marsh constitute a threat to the wetland habitats. Activities such as improper grading during development, over-grazing, and construction on steep slopes or highly erodable soils can lead to the transfer of soil materials to fresh water streams and ultimately to the Marsh. Moreover, riparian vegetation along tributary streams is important habitat to many species of Marsh wildlife and helps to maintain water quality in streams and sloughs.

To adequately protect the Marsh, control over runoff, erosion, and sediment transfer are necessary in the immediate Marsh watershed. Controls should also be established to limit disruption of riparian vegetation and habitat.

Findings

1. The tidal marshes of the Suisun Marsh are an important wildlife habitat and also contribute to the maintenance of water quality in the San Francisco Bay.

2. The managed wetlands are a unique resource for waterfowl and other Marsh wildlife, and their value as such is increased substantially by the management programs used by waterfowl hunting clubs and public agencies to enhance the habitat through the encouragement of preferred food plant species. However, management challenges exist on many managed wetland units, including: water quality concerns such as salinity; effective water circulation, conveyance and drainage due to subsided land; restrictions resulting from endangered species protection; and ongoing exterior levee system integrity and maintenance issues.

3. Individual management plans were developed for each waterfowl hunting club in the 1980s, and were reviewed by the California Department of Fish and Game and certified by the San Francisco Bay Conservation and Development Commission. The management plans include site information on each club's infrastructure, a water management schedule, and a discussion of management activities needed to accomplish the schedule. Land managers can conduct ongoing management activities described in the plans, such as maintenance, repairs, and enhancements, without having to apply for separate permits from the Commission for each activity.

4. The Suisun Marsh contains approximately 230 miles of levees, many of which have been constructed over time largely using material dredged from adjacent waterways and were not constructed to meet flood protection standards. Consequences of levee failure may include: risks to life; damage to residences, businesses, utilities, and transportation infrastructure; loss of recreational opportunities; changes in water quality conditions; loss of managed wetlands values and functions; and changes in ecosystem conditions. Appropriate methods of levee repair and maintenance can both protect managed wetlands and neighboring properties as well as avoid adverse impacts to wildlife habitat both on and adjacent to levees.

5. The tidal marshes and managed wetlands can also provide excellent conditions for mosquito production. The Solano County Mosquito Abatement District regulates Marsh management programs to ensure adequate mosquito control.

6. There are several seasonal marshes around the periphery of the managed wetlands. They have high value for Marsh-related wildlife and also serve to buffer the Suisun Marsh to a certain extent from potential adverse ecological and aesthetic impacts. The seasonal marshes are presently used for grazing during the dry summer months.

7. The lowland grasslands constitute an important transition area between the Marsh and the uplands which has high value to Marsh-related wildlife, particularly during the winter months when the wetlands are flooded. The lowland grasslands also play an important role in protecting the Suisun Marsh from potential adverse impacts resulting from adjacent land uses, such as water pollution, predation by domestic pets, and noise. Most of the lowland grasslands are presently used for grazing, which helps to maintain the habitat, providing that over-grazing does not occur.

8. Several areas adjacent to the wetlands were originally marshland but have been segregated from tidal action due to land reclamation, diking and filling for grazing purposes, cultivation or flood protection. Examples of historic marshes occur at Thomasson near Cordelia, east of Suisun City and in the area east of Montezuma Slough between Birds Landing and Collinsville. These areas could be restored to wetlands status by returning them to tidal action.

9. The tidal marshes, managed wetlands, adjacent lowland grasslands, and seasonal marshes are unsuitable for urban development due to several physical constraints. They are subject to periodic flooding and tidal action. They are also underlain by saturated soft Bay muds which tend to settle under structures. Soft Bay mud may also experience severe ground shaking and failure during earthquakes.

10. The upland grasslands and cultivated areas adjacent to the Suisun Marsh are critical to its protection. These undeveloped areas, presently used for grazing cattle and cultivated agricultural lands, function as a buffer for the Marsh. Development in the uplands adjacent to the Marsh would remove this protective function and result in potential adverse ecological and aesthetic impacts. Furthermore, these areas represent valuable habitats for many species of Marsh-related wildlife.

11. Soil conditions and seismic activity in the uplands adjacent to the Suisun Marsh may also create hazards to urban development. In addition, earth disturbance, such as grading and filling to enable development in hazard areas, can lead to erosion which degrades valuable aquatic and wildlife habitat due to sedimentation. For example, the Benicia hills west of Highway 680 are steeply sloped, contain landslide deposits, include soils with high susceptibility to landslides and erosion, and are the location of the active Green Valley Fault. Major portions of the Potrero Hills are also steeply sloped with soils having high erosion potential. Other hills and mountains in the immediate Marsh watershed, particularly the hills around Rockville and the Vaca mountains, contain steep slopes with soils that are either easily eroded or susceptible to landslides.

12. Sediments carried into the Marsh by soil erosion in the watershed could degrade aquatic and wildlife habitats. They would probably cause higher water turbidity in the sloughs reducing light penetration into the water which may be very detrimental to phytoplankton populations which form the base of the Marsh fishery food chain. In addition, increased sedimentation can reduce the range of migratory fish spawning habitat and increase fish egg mortality.

13. Some areas of lowland grassland and seasonal marsh (notably east of Suisun City and east of Montezuma Slough) are historic marshlands and could be restored as tidal marshes or managed wetlands.

14. Physical barriers to wildlife movement are created by such structures as highways, railroad tracks, exposed pipelines, and fences. However such barriers can act to protect the Marsh from certain adverse impacts such as predation by domestic pets.

Policies

1. The managed wetlands, tidal marshes, lowland grasslands and seasonal marshes should be included in a primary management area. Within the primary management area existing uses should continue and both land and water areas should be protected and managed to enhance the quality and diversity of the habitats.

2. Agriculture within the primary management area should be limited to activities compatible with, or intended for, the maintenance or improvement of wildlife habitat. These include extensive agricultural uses such as grain production and grazing. Intensive agricultural activities, involving removal or persistent plowing of natural vegetation and maintenance of fallow land during part of the year, should not be permitted. Grain production should be confined to the Grizzly Island Wildlife Area and relatively small, well-suited areas of some of the large waterfowl hunting clubs. Grazing should be used to control vegetation on waterfowl hunting clubs where plant cover is sub-optimum for waterfowl use and should be discouraged on those properties where there is already a good mixture of preferred waterfowl food plants. Grazing pressures should not exceed sound range management practices.

3. The tidal marshes in the primary management area should be preserved. Practices recommended by the Solano County Mosquito Abatement District to control mosquitoes, including ditching, drainage, pesticide application, burning, and the use of mosquitofish should be conducted only where absolutely necessary. Because of potential adverse environment impacts, pesticide application and burning for mosquito control should be applied only as a last resort. Efforts toward biological control of mosquitoes should be intensified.

4. The water management schedules originally developed by the U.S.D.A. Soil Conservation Service and the California Department of Fish and Game and ratified by the Solano County Mosquito Abatement District should be modified as necessary in response to new biological, technical and management challenges. Modified water schedules should include provisions for adaptive management (systematic process for evaluating and improving strategies) to better address management challenges and should be used to the maximum extent possible in the managed wetlands. Individual club management plans should include the most current water management schedules and management approaches. These schedules provide the most desirable habitat for waterfowl as well as many other types of marsh wildlife, and may also result in a significant reduction of vector production if properly managed.

5. In order to improve the efficiency of water control management in the Marsh, the Suisun Resource Conservation District should be empowered to develop and enforce regulations establishing sound water management practices on all privately-owned managed wetlands within the primary management area.

6. The Suisun Resource Conservation District should be empowered to improve and maintain exterior levee systems as well as other water control facilities on the privately-owned managed wetlands within the primary management area.

7. Burning in the primary management area is a valuable management tool. However, it should be kept to a minimum to prevent uncontrolled fires which may destroy beneficial plant species and damage peat leaves, and to minimize air pollution.

8. Permanent ponds provide shelter and food for resident and migratory wildlife species, including waterfowl broods, molting waterfowl, pelicans and shorebirds. Permanent ponds should maintain high circulation rates and, where necessary, should be drained every three to five years to reset the vegetative composition. To control mosquito production, water levels in permanent ponds should be kept constant. Water salinity levels exceeding 17mS/cm may be toxic to ducklings and should be considered when managing permanent ponds.

9. The upland grasslands and cultivated lands surrounding the Marsh should be included in a secondary management area. The function of the secondary management area should be to act as a buffer area insulating the habitats within the primary management area from adverse impacts of urban development and other uses and land practices incompatible with preservation of the Marsh. The boundaries of the secondary management area should, for the most part, correspond to physical barriers to wildlife movement, with exceptions where necessary to control specific potential threats to the Marsh from beyond the wildlife barrier. The proposed boundary of the secondary management area is shown on the Protection Plan Map.

10. Agricultural uses consistent with protection of the Marsh, such as grazing and grain production, should be maintained in the secondary management area. In the event such uses become infeasible, other uses compatible with protection of the Marsh should be permitted. The value of the upland grassland and cultivated lands as habitats for Marsh-related wildlife should be maintained and enhanced where possible by planting or encouraging valuable wildlife food or cover plant species.

11. Existing non-agricultural uses, such as Solano Garbage Company, Pacific Reclamation and Disposal Inc., and Explosive Technology Corporation, on sites within the secondary management area should be allowed to continue if they are conducted so that they will not cause adverse impacts on the Suisun Marsh. Any future change in uses of these sites should be compatible with the preservation of the Suisun Marsh and its wildlife resources.

12. Exceptions to the land management practices recommended for the primary and secondary management areas should be made in the Collinsville area. The Collinsville area has potential for water-related industry and port use due to its location adjacent to a deep water channel. Therefore, the upland grasslands, seasonal marshes, and lowland grasslands west of Collinsville Road, as identified on the Protection Plan Map, should be reserved for water-related industry and port uses. Present extensive agricultural practices should be continued until this site is needed for water-related industrial or port development. However, wetland resources on portions of this site may be enhanced or restored consistent with Suisun Marsh Protection Plan policies on water-related industry.

Any wetland restoration or enhancement project should provide for the protection of adjacent property from flooding that could occur because of the project and should include a long-range management program that assures proper stewardship of the wetland.

The area between the industrial area and Montezuma Slough varies from 1/3-1 mile wide and consists of extensive lowland grasslands and seasonal marshes. These habitats are included within the primary management area and will also, due to their size, be able to function as an adequate buffer to protect the wetlands from potential adverse impacts of any future industrial or port development in the Collinsville area. In addition, this area, which is presently used for grazing, is historic marshland and some or all should be restored to wetland status through such actions as raising site elevations through placement of approved dredged materials, breaching levees, or improving water management practices.

13. Where feasible, historic marshes should be returned to wetland status, either as tidal marshes or managed wetlands. If, in the future, some of the managed wetlands are no longer needed for private waterfowl hunting, they should be restored to tidal or subtidal habitat, or retained as diked wetland habitat and enhanced and managed for the benefit of multiple species. Sound practices consistent with Marsh preservation recommended by the Solano County Mosquito Abatement District to control mosquitoes should be followed during and after marsh restoration.

14. Ongoing management activities, such as maintenance, repairs and enhancements, that are undertaken on managed wetlands in accordance with certified individual management plans should continue to be allowed without the need for further authorization from the Commission. On those managed wetlands no longer needed for private waterfowl hunting, any project for the restoration, enhancement or conversion of managed wetlands to subtidal or wetland habitat should include clear and specific long-term and short-term biological and physical goals, success criteria, a monitoring program, and provisions for long-term maintenance and management needs. Design and evaluation of the project should include an analysis of:

    (a) The anticipated habitat type that would result from managed wetland conversion or restoration, and the predicted effects on the diversity, abundance and distribution of fish, other aquatic organisms and wildlife;

    (b) Potential fill activities, including the use of fill material such as sediments dredged from the Bay and rock, to assist restoration objectives;

    (c) Flood management measures;

    (d) Mosquito abatement measures;

    (e) Measures to control non-native species;

    (f) Opportunities for a diversity of public access and recreational activities; and

(g) Water quality protection measures that may include monitoring for constituents of concern, such as methylmercury.

15. Any development in the Suisun Marsh watershed or secondary management area proposed for areas that have poor soil conditions for construction or that are seismically active, should be controlled to prevent or minimize earth disturbance, erosion, water pollution, and hazards to public safety. Local runoff, erosion, and sediment control ordinances should be established in the immediate Suisun Marsh watershed to protect the Marsh from these potential adverse effects.

16. Riparian vegetation in the immediate Suisun Marsh watershed should be preserved, due to its importance in the maintenance of water quality and its value as Marsh-related wildlife habitat. Stream modification should only be permitted if it is proved necessary to ensure the protection of life and existing structures from floods and only the minimum amount of modification necessary should be allowed.

17. State and federal agencies and the Solano County Mosquito Abatement District should continue and expand their research efforts on marsh management with the objective of improving wildlife habitat, preserving rare and endangered species and controlling mosquitoes. These agencies and the Suisun Resource Conservation District should periodically conduct joint reviews of marsh management programs to ensure that they are compatible with one another and consistent with the policies of the Suisun Marsh Protection Plan.

Amended November 2007

PART III

CARRYING OUT THE PROTECTION PLAN

The Suisun Marsh Protection Plan can serve as the basis for protecting and improving the Suisun Marsh as an important wildlife habitat and natural resource only if the Plan can be effectively carried out. This section of the Plan contains the Commission's recommendations for carrying out the Plan.

General Recommendations (see below for definitions of terms used in this section)

1. **Establish the Suisun Marsh Protection Plan as the Statewide Policy to Preserve, Protect, Enhance, and Restore Suisun Marsh Resources.**

   Because the Suisun Marsh is a unique and valuable natural resource in which all the people of the State have a substantial and continuing interest, and because the wise use, conservation and enhancement of marsh and managed wetland habitats for the benefit of present and future generations are of great concern to the people of California, it should be the policy of the State to protect, use with discretion, enhance, and where possible, restore the tidal marsh, managed wetlands, seasonal marsh, lowland grasslands, upland grasslands, riparian areas, and waterways of the Suisun Marsh in accord with the policies of the Suisun Marsh Protection Plan.

2. **Require the Actions of All Governmental Agencies In the Marsh Area to be Consistent With the Suisun Marsh Protection Plan.**

   State, regional, and local agencies with regulatory responsibilities in the Marsh should be required to carry out those responsibilities and activities in conformity with the Suisun Marsh Protection Plan. The Marsh should be considered part of the BCDC segment of the California coastal zone and, to the extent possible under applicable Federal law (in particular the Federal Water Pollution Act of 1972). Federal agencies should comply with the provisions of the Protection Plan. Should Federal agencies undertake programs, activities, or developments that are not consistent with the Protection Plan, the State agency designated to carry out the Plan should identify those inconsistencies and actively seek either conformity in Federal actions or Federal legislation to require conformity.

3. **Give Local Governmental Agencies With Jurisdiction In the Marsh Primary Responsibility for Carrying Out the Suisun Marsh Protection Plan Through a Local Protection Program.**

   At present, most existing uses (particularly agricultural and duck club uses) appear to be compatible with protection of the Marsh, and continuation of those uses appears to be desired by most property owners in the area. Furthermore, local governments in the area are already regulating land use in and around the Marsh, and to avoid unnecessary duplication in governmental regulation, responsibility for carrying out the Protection Plan on a day-to-day basis should rest with local government. Local governments, the Solano County Local Agency Formation Commission and special districts should bring general and specific plans, zoning, land use regulations, ordinances and procedures, and governmental programs into conformity with the Protection Plan. Such changes should be incorporated into a Solano County local protection program to be submitted for certification by the State agency designed to carry out State regulatory responsibilities under the Protection Plan.

4. **Establish Limited State Responsibility for Carrying Out the Suisun Marsh Protection Plan.**

   As the Suisun Marsh Preservation Act itself recognizes, the Marsh is a resource of regional, State, and national significance, and there is a need for a continuing State role in protecting the Marsh. Furthermore, although existing uses are for the most part compatible with Marsh protection, Solano County is urbanizing rapidly. This will increase pressures to convert agricultural and duck clubs lands to other uses, and further development in the Marsh watershed would increase the potential for damage to the Marsh from sedimentation and increased urban runoff. The role of the State, therefore, should be to ensure that, to the maximum extent feasible, existing uses in the Marsh will continue, and that further development in the Marsh watershed does not adversely affect the water quality of the Marsh. The State's responsibilities should be exercised through a permit system for development within the primary management area identified in the Protection Plan, appellate review over specific local decisions significantly affecting the Marsh, and certification of the local protection program. The State should also acquire fee or less than fee interests where appropriate, and all State land should be managed in a manner that is consistent with the Protection Plan. On lands owned, controlled, or held in trust by a State agency, primary responsibility for carrying out the management recommendations in the Plan should rest with that agency.

5. **Designate the San Francisco Bay Conservation and Development Commission as the State Agency to Carry Out the State's Responsibilities Under the Regulatory Recommendations of the Suisun Marsh Protection Plan.**

   BCDC should be designated as the State agency to carry out the State's regulatory responsibilities under the recommendations of the Protection Plan. The Commission already exercises permit jurisdiction over most of the primary management area identified in the Protection Plan and through its unique blend of local, State, Federal, and public representation, can provide the blend of perspectives essential to carrying out the Plan successfully.

6. **Acquire Property Interests to Provide Increased Public Recreational Opportunities, to Set Aside Refuge Areas for Protecting Waterfowl During Hunting Season, and to Expand the Marsh by Restoring Areas to Tidal Action.**

   Existing State and local authority under the police power is adequate to protect the Marsh for the foreseeable future, and large-scale acquisition in the Marsh area, particularly acquisition of development rights, is both unnecessary and legally questionable. Acquisition of fee interests should therefore be limited to obtaining parcels for public use, and resource management and acquisition of development rights should be limited to those specific cases where there are no other reasonable means, including use of the police power, for assuring retention of property in a use compatible with protection of the Marsh. This reflects the policy of the State with regard to the acquisition of development rights set forth in the recently enacted legislation establishing the State Coastal Conservancy.

   Acquisition should not be the responsibility of the State agency designated to carry out the State's regulatory responsibilities under the Plan. Rather, acquisition should be carried out by State agencies with the necessary expertise and resources, such as the Wildlife Conservation Board or the State Coastal Conservancy. Any acquisition should be consistent with the Suisun Marsh Protection Plan.

Definitions

1. "Suisun Marsh" or the "Marsh" means tidal marsh, water-covered areas, diked-off wetlands, seasonal marshes, lowland grasslands, upland grasslands, and cultivated lands shown on the Suisun Marsh Protection Plan Map. It includes both the primary and secondary management areas as shown on the Suisun Marsh Protection Plan Map.

2. "Primary management area" means the bays, sloughs, tidal marsh, diked-off wetlands, seasonal marsh, and lowland grassland shown on the Suisun Marsh Protection Plan Map.

3. "Secondary management area" means the upland grasslands, cultivated lands, and low-lying areas adjacent to the primary management area as shown on the Suisun Marsh Protection Plan Map.

4. "Watershed" means the immediate watershed of the Marsh upland from the secondary management area, including those creeks, streams, channels, or other water areas and adjacent riparian areas that are tributary to, or flow into, the Marsh.

5. "Managed Wetland" means those diked-off areas wherein water manipulation and/or the cultivation of waterfowl food plants is conducted to enhance habitat conditions for waterfowl and other water-associated birds, wildlife, or fish. Such areas may be used either exclusively or in combination for both consumptive (hunting or fishing) or non-consumptive (non-hunting or non-fishing) uses such as nature study, photography, and similar passive wildlife use activities.

6. "BCDC" means the San Francisco Bay Conservation and Development Commission as constituted by the McAteer-Petris Act (Government Code Sections 66600 through

66660.1) and the Nejedly-Bagley-Z'berg Suisun Marsh Preservation Act (Chapter 9, Division 2 of the Fish and Game Code) or such successor agency as the Legislature may designate.

7. "Local government" means Solano County, the Cities of Suisun City, Fairfield, and Benicia, and the Solano County Local Agency Formation Commission.

8. "Special district" means any public agency, other than a local government as defined above, formed pursuant to general law or special act for the local performance of governmental or proprietary functions within limited boundaries. "Special district" includes, but is not limited to, a county service area, a maintenance district or area, an improvement district or improvement zone, a mosquito abatement district, a resource conservation district, an irrigation district, a reclamation district, or any other zone or area, formed for the purpose of designating an area within which either a property tax rate will be levied to pay for a service or improvement benefiting that area or a special function will be carried out within that area.

9. "Local protection program" means those provisions of any general or specific plan, zoning, land use regulations and procedures, and programs adopted by any local government or special district for the purpose of applying the Suisun Marsh Protection Plan policies more specifically.

10. "Plan" and "Protection Plan" means the Suisun Marsh Protection Plan now and as it may be amended in the future, including this section on carrying out the Plan.

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

Relation of the San Francisco Bay Plan and the Suisun Marsh Protection Plan

The Suisun Marsh Protection Plan is intended to be a more specific application of the general, regional policies of the San Francisco Bay Plan and to supplement those policies where appropriate because of the unique characteristics of the Suisun Marsh. Therefore the policies of both the Bay Plan and the Suisun Marsh Protection Plan apply in the area covered by the latter, except where the two may conflict. In that case, the more specific policies of the Suisun Marsh Protection Plan control.

Regulation Recommendations

1. **Responsibilities of Local Governments and Special Districts**

   Local governments should have primary responsibility for carrying out the Plan in accordance with a protection program developed by local government and certified by the State agency designated to carry out the Plan at the State level. A local protection program, prepared by Solano County, should include the relevant portions of the general plans, development and maintenance plans and regulatory procedures of Solano County; Solano County Local Agency Formation Commission; the Cities of Benicia, Suisun City, Fairfield; and special districts located wholly or partially within the Marsh. Subsequent to certification, Solano County should have responsibility for reviewing and approving projects in or affecting the Marsh, including projects of special districts; the Cities of Benicia, Suisun City, and Fairfield; and the Solano County Local Agency Formation Commission for consistency with the local protection program.

   After certification of the local protection program, special districts, the Solano County Local Agency Formation Commission, and the Cities of Benicia, Fairfield and Suisun City should ensure that their plans, programs, regulations and activities are consistent with the Solano County's certified local protection program and the Plan. As the special district most directly involved with water management in the Marsh, the Suisun Resource Conservation District should be given added authority by the Legislature, and special responsibility for developing a program for improving and regulating water management within the primary management area.

   a. **Preparation of the Local Protection Program**
      Within two years of the effective date of legislation to carry out the Plan, Solano County should develop and submit a local protection program for certification by the State agency designated to carry out the Plan. The following procedure should be used to prepare the program:

      (1) With six months of the effective date of legislation to carry out the Plan, the Solano County Local Agency Formation Commission, and the Cities of Benicia, Fairfield and Suisun City should submit to Solano County those portions of their general and specific plans, land use regulations and procedures, zoning and public works programs and plans that affect the Marsh together with any proposed changes designed to bring their plans and procedures into conformity with the Protection Plan.

(2) Within six months of the effective date of legislation to carry out the Plan, special districts that issue permits, grant approval for development, or that conduct activities that do or may affect the Marsh, should also submit to Solano County their development plans and regulatory procedures, together with any proposed changes to bring their plans and procedures into conformity with the Protection Plan.

(3) The submitted plans and procedures and proposed changes should be considered by Solano County in the preparation of the local protection program. The County should evaluate the proposed changes and inform the affected local government or special district whether any proposed change would be effective to bring the plan or procedure into conformity and should suggest to the affected local government or special district any additional changes that may be necessary. In case of disagreement, the County should consult with the designated State agency, which should advise the concerned agencies of the action that should be taken, the changes, if any, necessary to conform to the policies of the Plan, and the agency that should undertake the changes.

(4) To resolve conflicts and to make the best use of the time and resources available to State and local agencies, the designated State agency should assist Solano County by providing advice, data, and staff support. State and federal funds should be made available for the preparation of the local protection program.

(5) During the preparation of the local protection program, local governments and special districts should afford the widest reasonable opportunity for public participation and consultation with other agencies, including adequate public notice, review periods, workshops, and public hearings.

(6) Within one year of the effective date of legislation to carry out the Plan, Solano County should submit to the designated State agency a proposed local protection program which should indicate relevant portions of general and specific plans, zoning ordinances and maps, land use regulations and procedures, development plans, maintenance programs, and the relevant policies, activities and procedures of Solano County, the Solano County Local Agency Formation Commission; the Cities of Benicia, Suisun City and Fairfield and special districts and indicate the changes, if any, necessary to conform to the policies of the Plan and what agency should undertake the change.

(7) Within 120 days aver the receipt of a proposed local protection program for review, the designated State agency should advise Solano County and any other concerned local government or special district whether the proposed program conforms to the policies of the Plan, and, if not, what further measures are necessary.

(8) After receiving the advice of the designated State agency, Solano County and any other concerned local government or special district should undertake any necessary changes to general or specific plans, zoning ordinances and maps, land use regulations and procedures, development plans, and maintenance programs. Amendments to a local general plan for the purpose of developing a certified local protection program should not constitute an amendment of a general plan for purposes of Section 65631 of the Government Code.

(9) Thereafter Solano County should submit a revised local protection program to the designated State agency with a request that it be certified as consistent with the Plan and, within 90 days after securing the request for certification, the designated agency should act on the request.

(10) During preparation of the local protection program, no local govern ment should approve any amendment to a general plan, rezoning, capital expenditure, subdivision, annexation, or other significant land use change or development within the Marsh unless the designated State agency states in writing that the proposed approval would be consistent with the Plan.

b. **Content of Local Protection Program**

The local protection program should set forth the criteria and procedures Solano County will use to apply the Plan's policies, including any specific plans, regulations and maps necessary for the proper use, protection, preservation and enhancement of natural and man-made resources. It should also include the relevant plans, programs and activities of other local governments and special districts. The local protection program should include, but not be limited to, the following:

(1) **Marsh, managed wetland, and water resources.** Protection of tidal and seasonal marshes, managed wetlands, sloughs, bays, and waterways within or tributary to the Marsh, including (a) controls on diking, flooding, filling and dredging of Marsh sloughs, managed wetlands and marshes; (b) regulations for control of utility extensions, operation of septic tanks and waste water discharges; and (c) regulations to preserve, protect, and enhance plant and wildlife communities within and adjacent to the Marsh.

(2) **Agricultural resources.** Protection of those agricultural lands both within and adjacent to the Marsh necessary to ensure that current agricultural uses within the Marsh remain economically feasible for as long as possible, including (a) a determination of the overall land area and minimum size parcels necessary for long-term agricultural productivity and continuation of compatible agricultural uses within and adjacent to the Marsh; (b) prohibition of land divisions or other development inconsistent with Marsh protection and continued agricultural use; (c) identification of agricultural uses by type and intensity that are

consistent with the long-term preservation of the Marsh; (d) the identification of and controls on agricultural practices that may detrimentally affect the long-term productivity of the Marsh; (e) limitations of special assessments of agricultural lands for public services to serve urban needs (e.g., sewer and water) not generated by the agricultural lands themselves; and (f) a determination of the extent to which additional preferential assessment practices authorized by State law (e.g., the Williamson Act) should be applied to agricultural lands to assure long-term productivity as agricultural areas.

(3) **Geologic hazards.** Erosion, sediment, and run-off controls in the secondary management area and the watershed including special precautions to minimize soil erosion, especially during construction in areas of soil instability; special provisions for surface and subsurface drainage; specific grading ordinances to ensure that grading restores, rather than disrupts, natural patterns and volumes of surface runoff; and limitations on construction of impermeable surfaces over naturally permeable soils and geologic areas.

(4) **Creeks and riparian areas.** Controls on creekside developments that would protect riparian habitat and the Marsh from increased siltation and water run-off caused by waterway modification and vegetation removal along and immediately adjacent to waterways flowing into the Marsh area.

(5) **Water-related Industrial and port resources.** Assurance of the maximum beneficial use of deep water industrial and port areas near Collinsville, which should include regulations to carry out the policies of the Plan.

(6) **Scenic resources.** Procedures and standards to review the design and location of any new development or structures in or adjacent to the Marsh management areas to protect the visual characteristics of the Marsh and, where possible, enhance views of the Marsh.

(7) **Regulations and procedures.** Regulations and procedures to assure that (a) zoning and general plan designations are consistent; (b) development in the Marsh or watershed is subject to discretionary review by the local government with jurisdiction; (c) approval or disapproval of development is based on consistency or inconsistency with the policies and provisions of the relevant general plan policies and designations and the implementing land use regulations, including zoning, the California Environmental Quality Act and the Plan; and (d) conditions of approval require provision of public access where appropriate, mitigation for harmful impacts caused by the development and protection of public resources affected by the development. The procedures for reviewing development proposals shall include provisions for (a) giving adequate notice to concerned parties of pending applications for permits or other approvals; (b) responding to comments and recommen-

dations; (c) holding a public hearing; (d) preparing written findings and determinations when development is approved or disapproved; and (e) allowing an appeal of a decision with regard to development to the appropriate City Council or Board of Supervisors.

c. **Authority of Local Governments**
Local governments should continue to exercise existing permit authority in the Marsh. Permit applications denied by local government should not be appealable to BCDC.

2. **Water Management District**

The enhancement of the primary management area as a wildlife, particularly waterfowl, habitat can partly be achieved through improved water management by the privately-owned duck clubs. While many of the clubs already have instituted good water management practices, some clubs have not been willing, or financially able, to construct the necessary improvements and provide the necessary personnel to assure good water management. A local regulatory program should be established to achieve good water management on privately-owned lands within the primary management area. The Suisun Resource Conservation District, an existing special district, now includes most of the landowners involved in the operation and management of duck clubs. With some revisions in its powers, the District could ensure efficient and careful water management to enhance the wildlife resources. The Legislature should empower the District to regulate water management practices at managed wetlands controlled by privately-owned duck clubs, to require all duck clubs to be members of the District and contribute financially at a level sufficient to pay for water management practices to enhance the waterfowl habitat. The District should also be able to accept grants from governmental agencies and others for the purpose of conducting its activities. After receiving such powers, the District should survey the managed wetlands controlled by duck clubs and identify those wetlands where water management practices need improvement. Thereafter the District, after public hearing, should establish regulations establishing sound water management practices and procedures for compliance. The District should provide a written description of its water management practices, as well as any other pertinent rules, regulations or programs to Solano County for inclusion in the local protection program. If the Suisun Resource Conservation District will not or cannot perform these duties, then an appropriate State agency or special purpose district should assume these water management responsibilities.

The local agency that assumes the water management responsibilities for the privately held lands in the Marsh should be empowered to enter into agreements with landowners to offer water management services and provide water management facilities and to contract with landowners to undertake specified water management activities. The local agency should have both the authority to assess according to benefits derived, and the ability to accept grants and funds to be used for equitable economic assistance to landowners who contract or enter into agreements.

3. **Responsibilities of BCDC**

BCDC should be the State agency designated (1) to certify the local protection program for consistency with the Suisun Marsh Protection Plan, (2) to administer the Plan,

(3) to hear appeals from local governmental decisions affecting the Marsh that raise significant questions of consistency with a certified local protection program, (4) to decide what developments within the primary management area should be permitted.

The Commission's existing membership will allow it to adequately and efficiently administer the Plan because the representation on the commission provides for a variety of viewpoints from local, State, Federal and public representatives. Furthermore, BCDC already exercises permit jurisdiction over most of the primary management area.

Although the existing staff has much of the technical expertise needed to aid the Commission, some additional staff will be necessary for the Commission to accept the additional responsibilities of the Plan. The slight increase in staff capability would save considerable expense over creating a new agency to administer the Plan.

a. **Certification of Local Protection Program**
The following procedure should be used to certify the local protection program:

(1) After receiving the proposed local protection program for review, the BCDC should request comments from the Department of Fish and Game, other governmental agencies, and the general public. BCDC should allow a maximum 60-day comment period to governmental agendas; failure to provide comments within the period should be deemed to mean that the agency has no comments and approves the local protection program under consideration. Within 120 days after receipt of the proposed local protection program, BCDC should prepare written comments explaining the results of its review and making recommendations, if any, for changes.

(2) Within 90 days after receipt of a local protection program for certification, BCDC, after holding a public hearing, should approve or refuse to approve the program by resolution. Failure to either take a position of approval or disapproval of the program within this time period should be deemed an approval.

(3) BCDC should certify the local protection program if it finds that the program is fully consistent with the Plan. If the program submitted by Solano County is not consistent, BCDC should so resolve and should return the program to the County, stating in writing what further should be done to bring the proposed program into conformity with the Plan.

(4) If, within two years after legislation adopting the Suisun Marsh Protection Plan, Solano County has not submitted a local protection program that is consistent with the Protection Plan, the BCDC should exercise permit authority within the Marsh and should issue an order prohibiting any local government or special district from approving any, or undertaking any development within the Marsh where it finds such development may conflict with the Plan.

(5) BCDC should review and approve all changes or additions to the local protection program before such changes or additions are adopted by

a local government or special district. If experience shows that portions of the local protection program need revision, BCDC should be able to require any necessary revision.

b. **Authority of BCDC**
BCDC should be given the following added authority in order to carry out the Plan effectively:

(1) **Permit authority.** Pending certification of a local protection program, BCDC should exercise permit authority over the primary management area. Permits should be required for any development within the primary management area, and should be issued on the basis of consistency with the Plan and the provisions of the Suisun Marsh Preservation Act then in effect. After certification of the local protection program, BCDC should retain permit jurisdiction only over development in the primary management area having a significant impact on the Marsh. The issuance of permits for minor developments, to be defined by BCDC regulation, such as "minor repairs or improvements" under which the McAteer-Petris Act, should become the responsibility of local government, subject to the appeals procedure described in the next section.

(2) **Appellate review.** After certification of the local protection program, a local decision granting permission for a development in the Marsh should be appealable to BCDC if it is alleged that the decision is inconsistent with (a) a certified local protection program; (b) the Suisun Marsh Protection Plan; or (c) the provisions of the Suisun Marsh Preservation Act then in effect. Any person, including a member of the Commission or the Executive Director, should be entitled to bring an appeal to the Commission. Prior to hearing any appeal the BCDC should, by majority vote, decide whether the appeal presents a substantial issue. If a majority of the members decide to hear the appeal, BCDC should identify the substantive issue presented and schedule a public hearing. Upon hearing an appeal BCDC should affirm, revise, or modify a decision by a local government or special district or remand it to the local government or special district for review. Such decision should be made within 90 days after appeal is filed or the appeal should be deemed denied and the local decision affirmed.

(3) **Review authority over public works projects.** Because major public works projects are not usually subject to local governmental regulation and can have significant adverse effects on the Marsh, because they are presently administered by several different agencies, and because they can involve substantial public costs in planning, design, and operation, such projects should be evaluated as to consistency with the Plan at the earliest stage possible to avoid unnecessary public expense. Therefore, during the period prior to certification of local protection programs, public works projects and development programs (including but not limited to highway, waste disposal, wetland management, flood control, and water programs) affecting the Marsh that are

funded in whole or in part by the State or the Federal Government, and that could affect the Marsh, should be submitted to BCDC for review and approval as to consistency with the Protection Plan. After certification of the local protection program, such public works projects or programs within the Marsh should be submitted at the earliest possible stage to both BCDC and Solano County. Solano County should review and approve them as to consistency with the local protection program. BCDC's review of the local decision should be limited to appeals on the grounds stated previously in Section (2).

(4) **Marsh Protection Plan amendment.** BCDC should be able to amend the Plan except for boundaries, after 90 days public notice of a proposed amendment, a full public hearing, and upon the affirmative vote of two-thirds of its authorized membership. No amendment should be inconsistent with the enabling legislation. All affected local governments, other agencies implementing the Plan, and interested citizens should be notified of the amendments. BCDC should, by regulation, establish procedures for the implementation by local governments of any major amendments after local protection programs have been certified.

(5) **Guidelines and standards.** After public hearing, BCDC should be able to adopt such guidelines, standards and regulations as it deems necessary to carry out the Plan and implementing measures.

(6) **Enforcement.** BCDC should be able to issue cease and desist orders and to initiate judicial proceedings to prevent a violation or the Protection Plan. It should be empowered to subpoena witnesses, records and documents as part of any investigation or public hearing. The Attorney General should represent BCDC in all judicial proceedings and render legal advice as appropriate.

(7) **Review and reports.** BCDC should review the effectiveness of the local protection program to assure that the program is being followed by all local governments and special districts, that amendments to the Protection Plan are incorporated into it, and that procedures leading to decisions afford the opportunity for public involvement. BCDC should include the results of its review, and a summary of major changes to the Protection Plan and major decisions on implementation in an annual report to the Governor and the Legislature.

(8) **Cooperation with other agencies.** BCDC should develop relations with other State, Federal and regional agencies, especially the Department of Fish and Game, to permit BCDC to directly borrow expertise when needed from them; funds should be budgeted to support such interagency use of personnel. BCDC should assist State and local agencies, universities, private researchers, and other qualified persons and organizations to secure funding and technical resources for research, studies and other activities necessary to carry out the Protection Plan.

(9) **Public review of BCDC activities.** BCDC should adhere to procedures and notification deadlines that ensure that the largest number of interested persons are aware of pending decisions affecting the Plan and the Marsh, and that such persons have an ample opportunity to make their views known.

(10) **Public trust lands.** Tidal areas, especially sloughs in the Marsh, are largely held in trust by the State for the benefit of all the people of California. The State, as the legal guardian of certain Marsh areas, generally waterward of the mean high tide line, that are held in trust for the public should provide special protection for trust areas. The Plan should, consistent with applicable law, be the basis for determining permissible uses of public trust lands and waters. If the State Lands Commission determines that an area is subject to the public trust, any proposed development in that area inconsistent with the public trust should not be permitted to proceed.

c. **Modifications to the McAteer-Petris Act and the Bay Plan**
Some modifications to the McAteer-Petris Act (the BCDC law) will be necessary for the Commission to carry out the Plan. Thus, in addition to the powers and responsibilities discussed in Sections a, and b, above, the following changes should also be made to the McAteer-Petris Act:

(1) **Jurisdiction.** The Commission now exercises permit jurisdiction over most of the area within the primary management area. This jurisdiction mostly consists of "managed wetland" areas pursuant to Section 66610(d) of the California Government Code. The Commission's permit jurisdiction should be expanded to cover all development on all land and water areas within the primary management area, which the Plan has indicated are the portions of the Marsh needing the highest degree of protection. Furthermore, the Commission should be empowered to prepare a jurisdictional map that embraces the entire Marsh, and shows the limits of BCDC permit jurisdiction as the primary management area. The map should be filed with Solano County and the Cities of Fairfield, Benicia, and Suisun City, where it should be readily accessible so that concerned citizens can quickly and easily tell whether areas are within or without the Commission's permit jurisdiction. Once the map is filed with the County, it should define the Commission's geographic jurisdiction for permit purposes. A permit should be required for any development in the primary management area. Permits should be issued or denied on the basis of consistency or inconsistency with the Protection Plan and any legislation to carry out the Plan.

(2) **Transfer of administrative permit authority.** The Commission now has no authority under the McAteer-Petris Act to transfer permit authority after the local protection program has been certified. The Commission should have authority to define and transfer by regulation permit authority to local governments for activities that do not have significant impacts on the primary management area. In this way ordinary

activities will not normally need to be considered by the Commission saving the applicant and the public considerable time, effort, and expense.

(3) **Trust lands.** Because of the special responsibility of the State over public trust lands, tidelands, and submerged lands, BCDC should continue to exercise permit authority over State tidelands, other areas below mean tide line, or any other land or water areas held in trust for the public. In those areas, BCDC should continue to review projects and issue permits only for developments consistent with the trust.

(4) **Amendment of the Bay Plan and changes in priority use boundaries.** Within six months after the effective date of any legislation to carry out the Suisun Marsh Protection Plan, BCDC should make any necessary changes in the San Francisco Bay Plan and in existing priority use area boundaries to achieve consistency with the Suisun Marsh Protection Plan. Notwithstanding anything to the contrary in the McAteer-Petris Act, such changes should not require the approval of the Legislature.

4. **Responsibilities of Other Agencies of Government**

In addition to conducting programs and activities consistent with the Suisun Marsh Protection Plan, certain specific actions should be taken by the following agencies.

a. **Legislature and Governor**
Because of the importance of maintaining adequate water quality in the Suisun Marsh, the Legislature and Governor should actively seek Federal legislation to require the Bureau of Reclamation to comply with State and Federal water quality standards for the Delta and Suisun Marsh, including preferential release of Federal water if necessary to maintain Delta water quality. The Bureau should also be empowered to impose a charge on water users of Federal water diverted from the Delta to cover the Federal fair share of the cost of constructing, operating and maintaining any facilities required to provide a replacement fresh water supply of suitable quality to the Marsh, distributing such water within the Marsh, and efficiently using it on the managed wetlands within the Marsh. The Federal government should pay its fair share of all the costs associated with an alternative water system. The Federal fair share should be calculated on the basis of the amount of diverted water that would otherwise flow into the Suisun Marsh but for the Federal projects.

b. **State Water Resources Control Board**
The State Water Resources Control Board should set long term, easily monitored salinity standards for water in the Marsh ensuring that, (a) a mean annual soil salinity level between 8 and 18 ppt TDS in the first 12 inches of soil on the managed wetlands anywhere in the Marsh; and (b) soil salinities during the month of May not exceeding 9 ppt TDS in the first 12 inches of soil. Because it is currently not certain what quality of applied water is necessary to achieve these soil salinities, the State Board should also reserve the authority to make changes in any applied water salinity standards if experience shows that such

changes are necessary to achieve the desired soil salinity levels. The Board should seek the advice of other agencies, especially the Department of Fish and Game and the Suisun Resource Conservation District, prior to establishing standards. The Board should preclude water programs that threaten to cause any increase in channel salinity levels in the Suisun Marsh beyond the recent historical (1920-1970) mean salinity levels during the months of October through May. Should any alternative water supply be provided, it should be of adequate quality and quantity to meet the recent historical salinity levels.

c. **Department of Water Resources**
The Department of Water Resources should be empowered to impose and should impose a charge on State water users either under existing or proposed contracts sufficient to contribute the State's fair share toward the construction, operation and maintenance of any alternative fresh water source for the Suisun Marsh, for any necessary distribution system within the Marsh, and for any improved water management system in the wetlands necessary to efficiently use the alternative water supply. The fair share should be calculated on the basis of the amount of diverted water that would otherwise flow into the Suisun Marsh but for State projects.

d. **Department of Fish and Game**
Under the Suisun Marsh Preservation Act of 1974, the Department of Fish and Game prepared the Fish and Wildlife Element of the Suisun Marsh Protection Plan. The Department also manages several thousand acres of wildlife habitat and hunting areas at Grizzly Island and Joice Island, and has developed expertise for managing and administering wildlife and hunting areas. Management of State game reserves requires the presence of State personnel within the Marsh who have an opportunity to monitor the daily activity within the Marsh. For these reasons, the Department of Fish and Game plays a special role in protecting and enhancing the Marsh and should provide the following:

(1) **Review of the local protection program.** The Department should receive the proposed local protection program at the time it is sent to BCDC for preliminary review, and within 45 days of receipt should prepare written comments for consideration by the concerned local government and BCDC.

(2) **Consultation on appeals.** Within 30 days of receipt of a notice of appeal, the Department should review the appeal and should advise the BCDC of the Department's concerns and suggestions.

(3) **Advice on wildlife and water management.** The Department should review water standards proposed by the State Water Resources Control Board and advise the Board and BCDC whether the proposed standards could be easily monitored and would maintain recent historical (1920-1970) mean salinity levels within the primary management area. Upon request, the Department should provide advice and assistance to private landowners and the Suisun Resource Conservation District on methods to achieve high quality water and wildlife management within the Marsh.

(4) **Marsh programs.** The Department should be adequately funded and manned to provide expanded wildlife interpretive programs within the Marsh for the purposes of studying wildlife and educating the public about the Marsh.

(5) **Inspection and reports.** The Department should be empowered, funded and adequately manned to inspect the Marsh. Inspection should include periodic review of the wildlife conditions, marsh management programs, the impact of the public and private use, and any violations of the Fish and Game rules and regulations. In addition, the Department's personnel should continue in the enforcement of those local and State laws relative to the protection of the fish and wildlife resources of the Suisun Marsh, including laws and regulations legislatively mandated for the local protection program and the Plan, and consistent with the responsibilities and jurisdiction of other law enforcement entities of the local, state, and/or federal government. Written reports of the inspections should be prepared and made available to any concerned local government and BCDC. The reports should be sufficient for use as evidence when possible violations of State or local law or the Plan are observed. Inspectors should also be empowered to issue citations, which carry an adequate penalty, to persons found in violation of the State Fish and Game Code, the rules and regulations promulgated thereunder and State or local laws, rules, ordinances and regulations concerning littering, trespass, damage to private property or pollution legislatively mandated for the local protection program and the Plan, consistent with the responsibilities and jurisdictions of other law enforcement entities of the local, State, or Federal government.

e. **State Lands Commission**

Under Section 66605(9) of the Government Code, prior to issuing a permit the Commission must be able to find that "the applicant has such valid title to the properties in question that he may fill them in the manner and for the uses to be approved." The State Lands Commission has responsibility for administration of State lands and has established a special division for researching and determining title questions for San Francisco Bay. However, this unit's work now extends only to the Carquinez Strait. The special unit area should be expanded to include the Marsh. The State Lands Division should be empowered and adequately funded to provide information about title and ownership questions to BCDC within a fixed and reasonable period of time and should resolve any ownership disputes as quickly as feasible.

The State Lands Commission should have primary responsibility for carrying out the management recommendations in the Protection Plan on lands owned by the State and under the jurisdiction, control or supervision of the State Lands Commission. These include tidelands, submerged lands, swamp and overflowed lands, and beds of navigable rivers and streams. Lease of such lands and State Lands Commission supervision of legislatively granted lands should be based on consistency with the Protection Plan and any subsequent enabling legislation.

f. **Environment Protection Agency**

The Federal Environmental Protection Agency should include the primary and the secondary management areas as identified in the Suisun Marsh Protection Plan in the "Suisun Marsh Protection Zone" referred to in the grant conditions for the Fairfield Subregional Waste Water Treatment Plant.

Acquisition Recommendations

Public acquisition of property interests in specific parcels is recommended as a means to provide increased public recreation opportunities, to set aside refuge areas to protect waterfowl, especially during hunting season, and to improve the Marsh by restoring areas to marsh and managed wetland condition. Management programs for property acquired should be prepared by the agency designated to either acquire or manage the land prior to acquisition or within a reasonable time after acquisition

1. **Criteria for Acquisition**

   a. **Priorities.**
   The following priorities should be used for acquiring property interests:

      (1) Land should be acquired within or adjacent to the Marsh for restoration and for passive recreation purposes such as fishing and wildlife observation. Such land should be on the outer portions of the Marsh near population centers such as Suisun City or near existing transportation routes such as Highway 12.

      (2) Land should be acquired in or adjacent to the Marsh for the purpose of restoring areas to tidal action, or to marsh or managed wetland conditions where such restoration cannot be required as a condition of development. Within the Marsh, special emphasis should be placed on areas that would provide refuge areas to protect wildfowl, especially during hunting season.

      (3) Land should be acquired to provide additional wildlife habitat necessary for effective wildlife management, including consolidation of management units. Acquisitions under this category should avoid privately-owned property already managed for wildlife habitat.

   b. **Objectives.**
   The following objectives should guide acquisition:

      (1) Each parcel finally proposed for acquisition should be acquired as soon as possible by the appropriate public agency.

      (2) All purchases should be made on the basis of paying fair market value to the owner of the property being acquired.

      (3) Property interests to be acquired, whether a fee simple or lesser interest, should be tailored to the needs of the agency that will manage the property.

2. **Acquisition Agencies**

   The limited objectives of acquisition recommended in the Suisun Marsh Protection Plan suggest that a State level program is most appropriate. Current expertise in wetlands programs and the provision of public recreational activities in wetland areas clearly falls

at the State rather than the local level. Acquisition and management responsibility of land or interests in land designed to achieve wildlife enhancement objectives or regional recreational needs, such as hunting, most appropriately fall to the Department of Fish and Game.

State acquisition of property interests should be carried out by existing agencies, such as the Wildlife Conservation Board or the State Coastal Conservancy. Cooperation with private non-profit corporations, such as the Nature Conservancy and the Trust for Public Lands, should also be encouraged so that timely purchases can be made.

Some modifications of the powers of acquiring agencies should be made by the Legislature to allow greater flexibility in acquisition techniques. Thus, such agencies should have the power to acquire options and easements and to enter into agreements to lease back lands and to purchase and resell lands.

3. **Properties Recommended for Acquisition**

The following parcels are recommended for acquisition, in order of priority, to further attain the objectives of the Suisun Marsh Protection Plan (these sites are shown on the Protection Plan Map):

a. **Lawler Property.**
This approximately 1267-acre site, fronting on Suisun Slough and Hill Slough, is composed of seasonal marsh, lowland grassland, and upland grassland. Much of the area can be returned to tidal action and restored as tidal marsh. In addition, public access and recreation use, primarily fishing and nature study, can be provided along the slough shorelines. The site, on the outer portion of the Marsh, is adjacent to the population center of Fairfield-Suisun and is easily accessible from existing roads. In addition, there is upland area sufficient for construction of a public recreation staging area.

Acquisition of this site would cost approximately $2,550,000.

b. **Bryan Property.**
The Bryan property consists of approximately 251 acres of tidal marsh and upland area that has been used in the past as a spoil disposal site. The property fronts on both Suisun Slough and Peytonia Slough and is currently a popular fishing area. Public access and recreational use, chiefly fishing and nature study, could be provided through this acquisition. The property is adjacent to the Fairfield-Suisun population center, easily accessible by existing roads, and can also be easily reached by foot or bicycle. Sufficient upland area exists for construction of a public recreation staging area.

Cost of acquisition of this property would be approximately $1,057,000.

c. **Smith Property.**
The Smith property is 263 acres of tidal marsh and lowland grassland on Montezuma Slough and Cut-Off Slough. The property is adjacent to the Joice Island Unit of the Grizzly Island Wildlife Area and is a popular fishing site. The site can be improved to provide increased fishing use, and, as an extension of

the Joice Island Unit, a refuge area for wildlife. The site is easily accessible from Grizzly Island Road.

Cost of acquisition would be approximately $191,000.

Total cost of the 1,781 acres recommended for acquisition would be approximately $3,798,000.

4. **Tentative Acquisition Proposals**

The designation of a parcel of land on the Protection Plan Map as being considered for acquisition does not prevent the site from being used pending acquisition. Use and development compatible with the proposed acquisition, especially agricultural uses, can and should be permitted. But proposed uses and development that would be inconsistent with either wetland or recreational uses should be denied for a limited and specific time to give the acquiring agency an opportunity to purchase the property.

Property Interests to be acquired, whether a fee simple or lesser interest, should be tailored to the needs of the agency that will hold or manage the property. Voluntary purchase should be emphasized to reduce public costs. No lands should be acquired without consulting the State Lands Commission and the Attorney General's Office to determine whether the public trust applies to the land and the effect on value if the trust does apply. BCDC should approve any proposed acquisitions on the basis of consistency with the policies of the Protection Plan.

5. **Methods of Acquisition**

The traditional method of public acquisition-a one-time cash purchase of fee interest in property, following legislative appropriation of funds-will continue to play a large role in any acquisition program. Other techniques, however, should also be considered. For example, a landowner interested in selling his land to a public agency often hesitates because of the tax consequences of a major capital gain in a single year. Installment purchases are specifically prohibited by the California Constitution, but a State or local agency may acquire property over time through a lease agreement under which the agency receives a portion of the land each year in return for the lease payments. This method may be especially appropriate for the acquisition of large agricultural tracts.

In some cases acquisitions of lesser interests in land than fee simple, such as easements, rights-of-way and licenses should be considered favorably. Such lesser interests can be administered easily despite some additional enforcement problems and can provide substantial public benefits at considerably lower cost than fee acquisitions.

Tax Incentives

Preferential Assessments For Landowners

Property taxes can influence a landowner's decision with regard to land use. Property taxes are also one of the most important financial resources for local government.

Article 13, Section 8 of the California Constitution, provides a basis for enacting special preferential assessment standards for lands. The land assessment, against which a tax rate is applied, is the most important determinant of the actual taxes to be paid by a landowner Two main preferential property tax programs could provide tax savings to landowners with holdings in and near the Marsh. One, the well-known Williamson Act, allows the landowner to execute a ten year contract with the county whereby the land is restricted to certain uses. Thereafter, assessment is made on the basis of the income generating capability of the property rather than the usual highest and best use standard. Solano County has already entered into numerous Williamson Act contracts with landowners having holdings in and outside the Marsh. Thus, the County has already used tax incentives to encourage the retention of existing uses.

Critics of the Williamson Act have primarily mentioned two defects. One is the limitation that only counties may enter into a contract with the landowner. The second major defect is the ease with which a contract may be terminated, which considerably reduces the Act's effectiveness as a land use control tool. The loss of tax revenues from the lowered assessment, particularly on lands with development potential, is also seen by counties as a disadvantage. A second preferential tax program, not presently available in Solano County, is the 1973 Merced County Grassland Act. It is similar to the Williamson Act except that the landowner may enter into the contract with any governmental agency, not just a county. (At the time the Grasslands Act was passed, Merced County did not offer Williamson Act contracts with landowners holding marsh and managed wetland areas used primarily for recreation.) It also provides for a unique manner of assessment directly applicable to much of the land in the primary management area: sales prices of memberships or interest in proprietary organizations like duck clubs that own restricted land can also be used in part to calculate assessed values. Critics of this program, which was controversial when enacted, have pointed out that, in addition to sharing some of the defects of the Williamson Act, it is also subject to potential abuse because landowner-controlled special districts are authorized to enter into contracts that would determine property assessments.

While Solano County has in the past readily entered into Williamson Act contracts with landowners in and adjacent to the Marsh, County policy could change in the future. Furthermore, all of the existing contracts could be terminated by the County and the landowners if they wished to do so. Either eventuality could have highly undesirable impacts on the patterns of existing land use in the Marsh, as the Williamson Act is the only preferential assessment program presently available in Solano County.

Therefore it is recommended that legislation similar to the Merced Grasslands Act be enacted giving another agency the authority, after notice and public hearing, to enter into preferential assessment contracts with landowners in the Marsh if such contracts are not available from the County under the Williamson Act. That agency should probably be BCDC if it is the State agency designated to carry out the Plan, and in any event should not be a special district or other agency controlled by Marsh landowners. Furthermore, to forestall termi-

nation of existing Williamson Act contracts that are consistent with Marsh preservation, it is recommended that the approval of BCDC, or the State agency designated to carry out the Plan, be required for termination of any existing Williamson Act contract within the Marsh. BCDC approval should be based on the consistency of the proposed termination with the Suisun Marsh Protection Plan.

It is also recommended that the Legislature direct assessors to apply preferential property tax assessments to any land identified in the Plan for agricultural open space, environmental or wildlife habitat areas on the ground that such a designation is an enforceable restriction on land use.

State Subventions to Local Government

To offset the loss of revenue to local government and certain special districts due to the preferential tax treatment of lands in the Marsh, it is recommended that a new program of annual State subventions be developed. The program should provide replacement revenues for local losses in property taxes incurred as a direct result of any new preferential assessment applied to land within the Marsh after the effective date of legislation to carry out this Plan. Subventions should be paid only to replace actual losses in revenues suffered, and should be calculated on the basis of assessed values and tax rates in effect on January 1, 1976. Subventions should only be paid for properties subject to land use controls in the certified local protection program and the Plan. No State subventions or in lieu payments should be made for lands or interests in lands acquired by State agencies pursuant to the policies or recommendations of the Plan.

Costs and Funding

Costs of Implementing The Plan

The Plan is an investment in the protection, preservation and enhancement of the Suisun Marsh, the largest and, perhaps, most important remaining marsh and wetland in California. As with any other investment, there will be costs-in this case, the costs of the permits and appeals process, of planning by BCDC to keep the Plan up to date as conditions change, of planning and administration by local government to prepare the local protection program and administer the Marsh, of property acquisition and restoration, of title and trust questions by the State Lands Commission, of administration, enforcement and education by the Department of Fish and Game, and of providing adequate fresh water to the Marsh.

The Plan provides for many policies to be carried out by existing State and regional agencies and for local government to bring their general plans and land use regulations into conformity with the Plan. For State agencies, the proposal is not for massive new planning programs but rather for assignment of high priority to Marsh concerns in existing planning programs. Thus, the costs of bringing State and regional plans into conformity with the Plan should be minimal because such changes can be incorporated into the on-going planning activities of the affected agencies.

For local governments, in addition to planning programs now under way, there will be extra costs during the two-year period while the local protection program is being prepared. Based on discussions with planning officials in the affected local governments and others, the cost over the two years is estimated at $55,000 or about $27,500 per year. Federal funds to assist in this planning are potentially available under the Federal Coastal Zone Management Act of 1972, Section 701 of the U.S. Housing Act of 1968 (as amended), and Section 208 of the Federal Water Pollution Control Act of 1972.

The Plan recommends strongly that tax policies favor the protection of agricultural and managed wetland areas. Taxing agricultural land on its present use, not its speculative value, could, however, adversely affect the tax base of some local governments, causing taxes to rise on other types of property. In situations where this occurs, consideration should be given to State assistance to local governments, in the manner currently used to compensate localities for property tax reductions on Williamson Act open space lands. Consideration should also be given to the revenue-equalization potential of legislation like the Minnesota Fiscal Disparities Act of 1971.

For the State Lands Commission and the Department of Fish and Game some increase in costs can be expected if the recommendations to provide additional services are to be carried out. In the case of State Lands Commission it is estimated that approximately $100,000 each year for a three year period, will be needed to provide the research on State property interests and the public trust in the Marsh. However, if the work were to be scheduled to commence with fiscal year 1978, the project could be included as part of the Lands Commission's area projects program and no additional cost would be borne by the Lands Commission. For the Department of Fish and Game it is estimated that an additional $118,000 per year will be needed for the Department to adequately administer proposed programs within the Marsh and to provide the inspection and enforcement system recommended by the Plan.

For BCDC some increase in costs can be expected to provide staff assistance and data to local government during the certification process for the local protection programs, to prepare appeals for public hearings, and to keep the Plan up to date. It is estimated that approximately $20,000 will be needed for a two year period, or $10,000 per year, to assist in preparation and review of the local protection program.

Total increased State cost, except provisions for fresh water, are estimated to be from $128,000 to $228,000 the first and second year the Plan is In effect, from $118,000 to $218,000 the third year the Plan is in effect, and $118,000 thereafter, all in 1976 dollars.

Funds For Acquisition

Senate Bill 35 (Nejedly), has appropriated $2,000,000 and the Wildlife Conservation Board has matched that sum with an additional $2,000,000 for acquisition. Furthermore, the Wildlife Conservation Board is eligible to receive and use additional funds, such as Federal Land and Water Conservation Act grants, for acquisition.

Fresh Water Costs

1. **Water Management on Privately Held Lands**

   Over 75 percent of the wildlife wetland in the Suisun Marsh is private-owned. Most of this area is managed by duck hunting clubs. Approximately 1,200 to 1,500 members of about 150 clubs have access to these lands. Despite the private nature of this use and the restricted number with access to the Marsh, club owners provide a public benefit in the maintenance of the waterfowl and wildlife habitat. The protection of this habitat and its enhancement involves a burden which will fall primarily on private landowners. As a result, the financial and management resources of landowners in the Marsh-chiefly duck clubs-are extremely important to implementation of the Protection Plan.

   It is estimated that a typical club of 250 acres in relatively good condition, with 10 members, will require each owner to make an initial investment of at least $15,000. In addition, dues and assessments for expenses will average from $500 to $1,000 per year per member. If the initial investment is amortized at 6 percent over 25 years, then the real cost to owners runs from $1,700 to $2,200 per year, or from $40 to $50 for each day of permissible duck hunting for the land alone.

   The total value of the clubs' investment in land and improvements in the Marsh is estimated at $20-25 million. Annual expenditures on habitat maintenance (including water control, planting, etc.) probably range from $600,000 to $800,000 or $15 to $20 per acre. If these expenditures were not made, the attraction of the Marsh to fresh water waterfowl would diminish or public expenditures of an equivalent amount would be required. The largest cost component is water management and control.

   Not all duck clubs in the Marsh currently have optimum conditions for waterfowl. It has been estimated by the U.S.D.A. Soil Conservation Service that desirable improvements to optimize water control management would have a capital cost of about $7.4 million (1974 dollars), or an average of $200 per acre for all duck club lands. These figures do not include engineering and debt service.

   Deficiencies in water control facilities on clubs affect the price paid when a club is sold. In addition, the quality of water management on an individual club generally affects the quality of hunting available on that club, but it does not affect the quality of hunting on any other club. Given these facts, there would be little justification for public assistance or expenditure of funds in improving privately-owned lands. Over time, as the demand for duck hunting increases and as duck clubs are sold to new owners who wish to improve them, deficiencies will be removed. That there is sufficient demand is indicated by the rapid rise in the price of duck clubs. Over the past five years, prices have increased by 75 to 100 percent.

It is thus recommended that those costs continue to be borne by the private landowners. However any water management costs associated with more intensive or sophisticated water management programs due to deteriorating water quality from Delta diversions should be borne by the Central Valley Project and the State Water Project in accordance with the provisions of Section 2. In accord with an earlier recommendation, the Suisun Resource Conservation District ought to be given regulatory power over water management, which should tend to shorten the time it will take to achieve a high quality of water management at most of the clubs.

2. **Alternative Fresh Water Source and Distribution**

A much more formidable problem and expense is the increasing salinity in the Suisun Mash caused by diversion of fresh water from the Delta. If the Marsh is to be protected and enhanced, sufficient quantities of suitable quality water must be available. This can mean that Delta outflow is not decreased, and in some cases, is increased or that a new water supply of adequate quality and quantity is provided fur the Marsh. In addition to providing adequate quality water, any new source may require considerable capital expenditure for a distribution system in the Marsh and for increased water management facilities on the managed wetlands. U.S.D.A. Soil Conservation Service has estimated that the construction cost of such a system (in 1974 dollars) could be as high as $17.6 million. This cost does not include engineering, debt service, operating or maintenance costs. These costs should not be borne by the private landowner.

It is recommended that the capital, operating and maintenance costs of any replacement water supply, water distribution system and wetland water management facilities attributable to the effects on the Suisun Marsh of the State and Federal water projects, be paid for by the projects, and that the users of the exported water should reimburse the projects for any water systems needed to bring and distribute fresh water.

PART IV

PLAN MAPS

NATURAL FACTORS AND PLAN MAPS

Suisun Marsh Natural Factors Map

The Natural Factors Map shows the natural factors and resources of the Marsh pertinent to planning. The information on the map, as described in the legend, includes the Marsh habitat types and geologic factors. In addition, the map contains notes which identify and explain areas and conditions of particular importance to Marsh planning.

Suisun Marsh Protection Plan Map

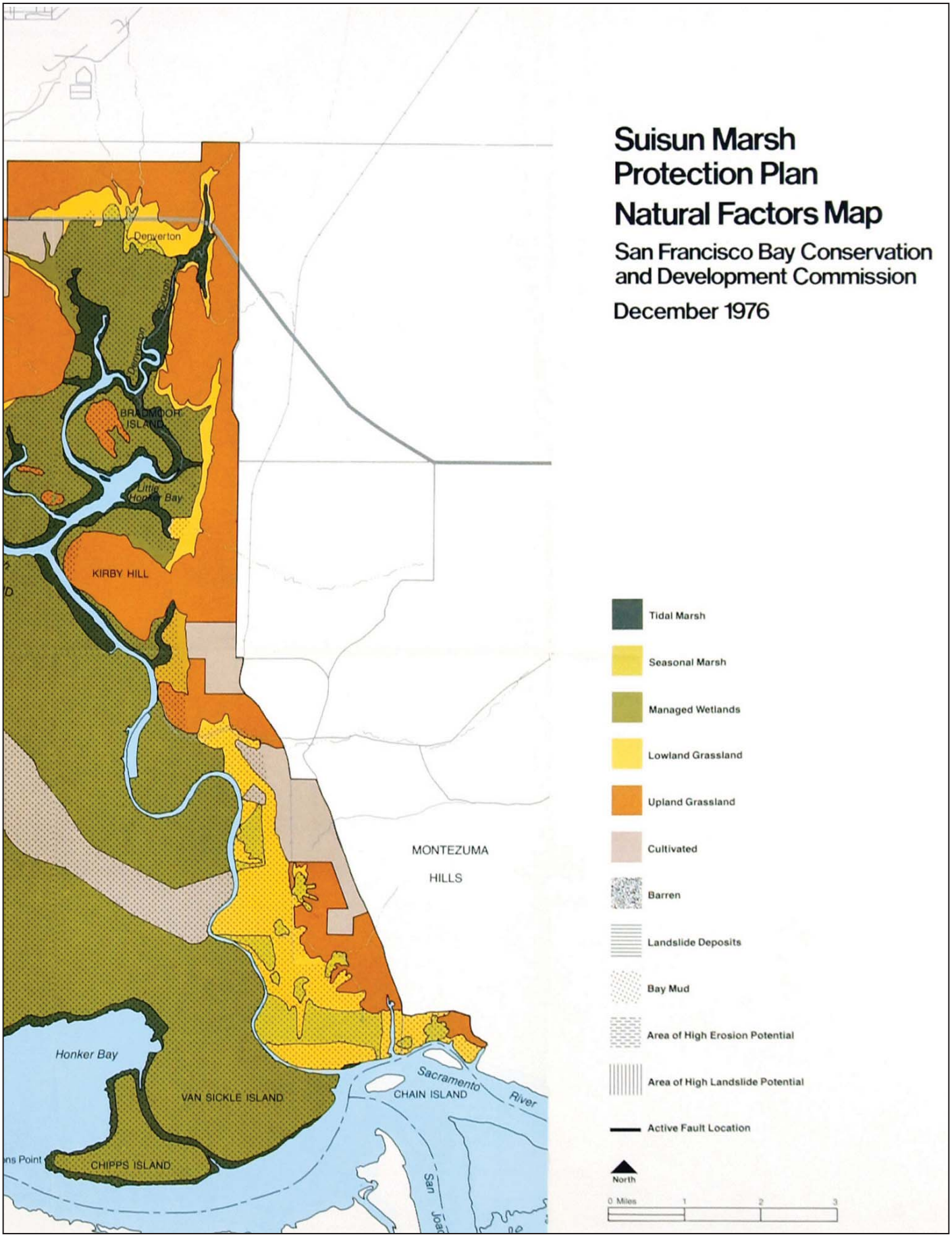
The Protection Plan Map is an integral part of the Suisun Marsh Protection Plan and is based on the Protection Plan policies. The map identifies the primary and secondary management areas and lands recommended for acquisition.

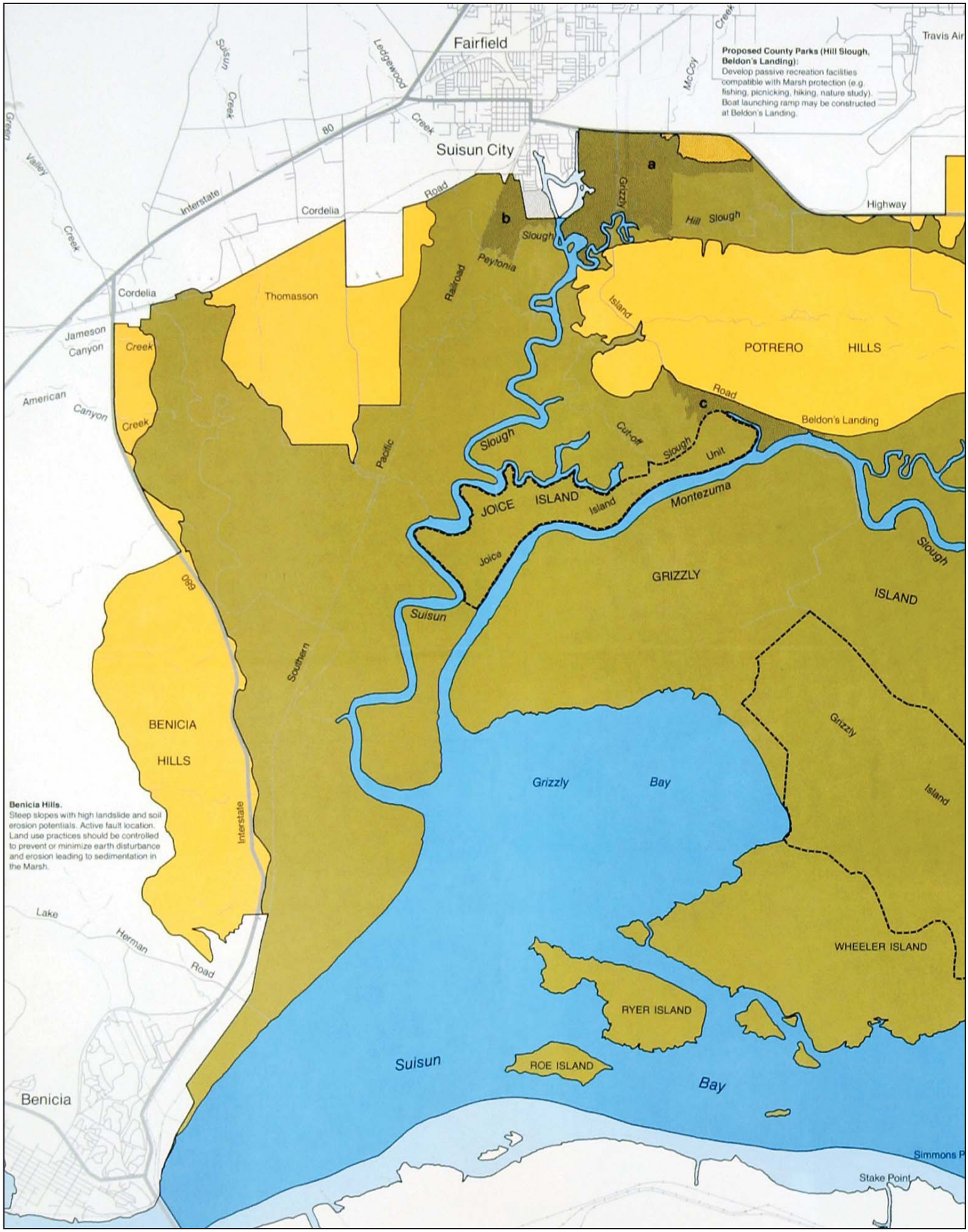
Protection Plan policy statements are printed on the map and are intended to be enforceable policies.

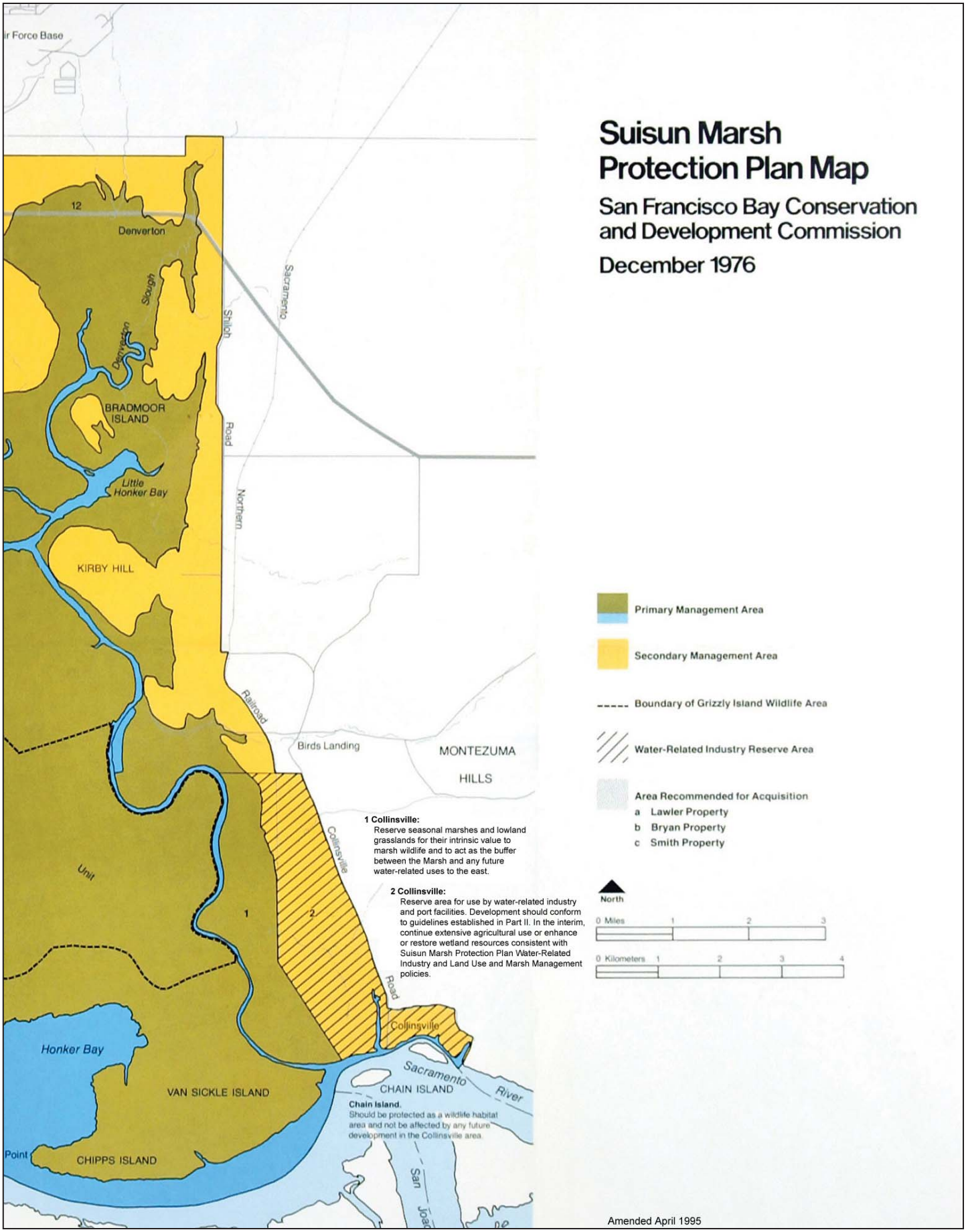
Boundaries of the Suisun Marsh

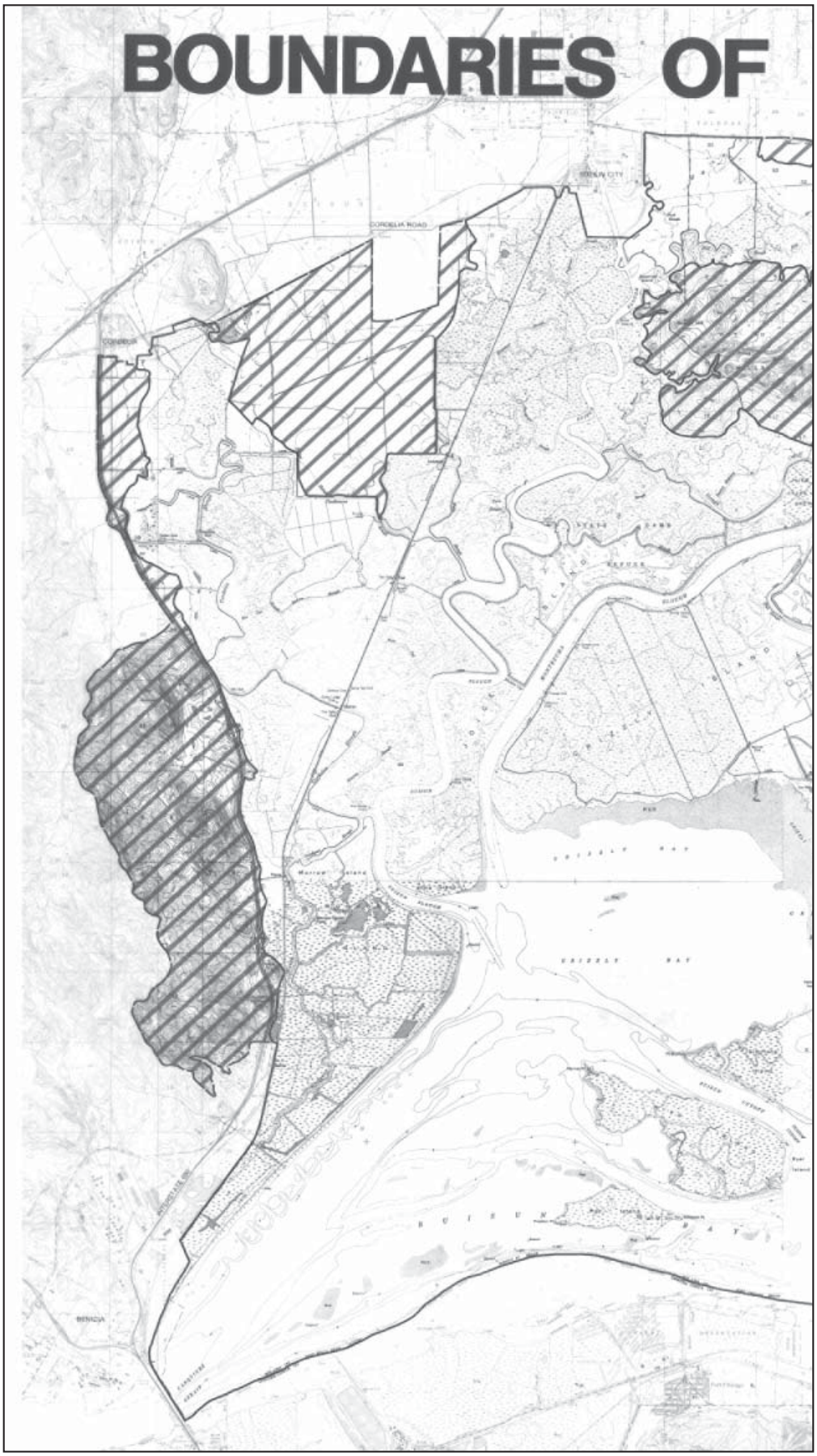
The Boundaries of the Suisun Marsh map is not part of the Suisun Marsh Protection Plan. The map is provided as a reference to the location of the primary and secondary management area as shown on the map “Boundaries of the Suisun Marsh” prepared and adopted by the San Francisco Bay Conservation and Development Commission on January 20, 1978 pursuant to Public Resources Code Section 29203. That map, which is at a scale of one inch equals 24,000 inches, should be used for any jurisdiction determination subject to the Suisun Marsh under the Suisun Marsh Preservation Act of 1977 (Public Resources Code Section 29000 through Section 29612).

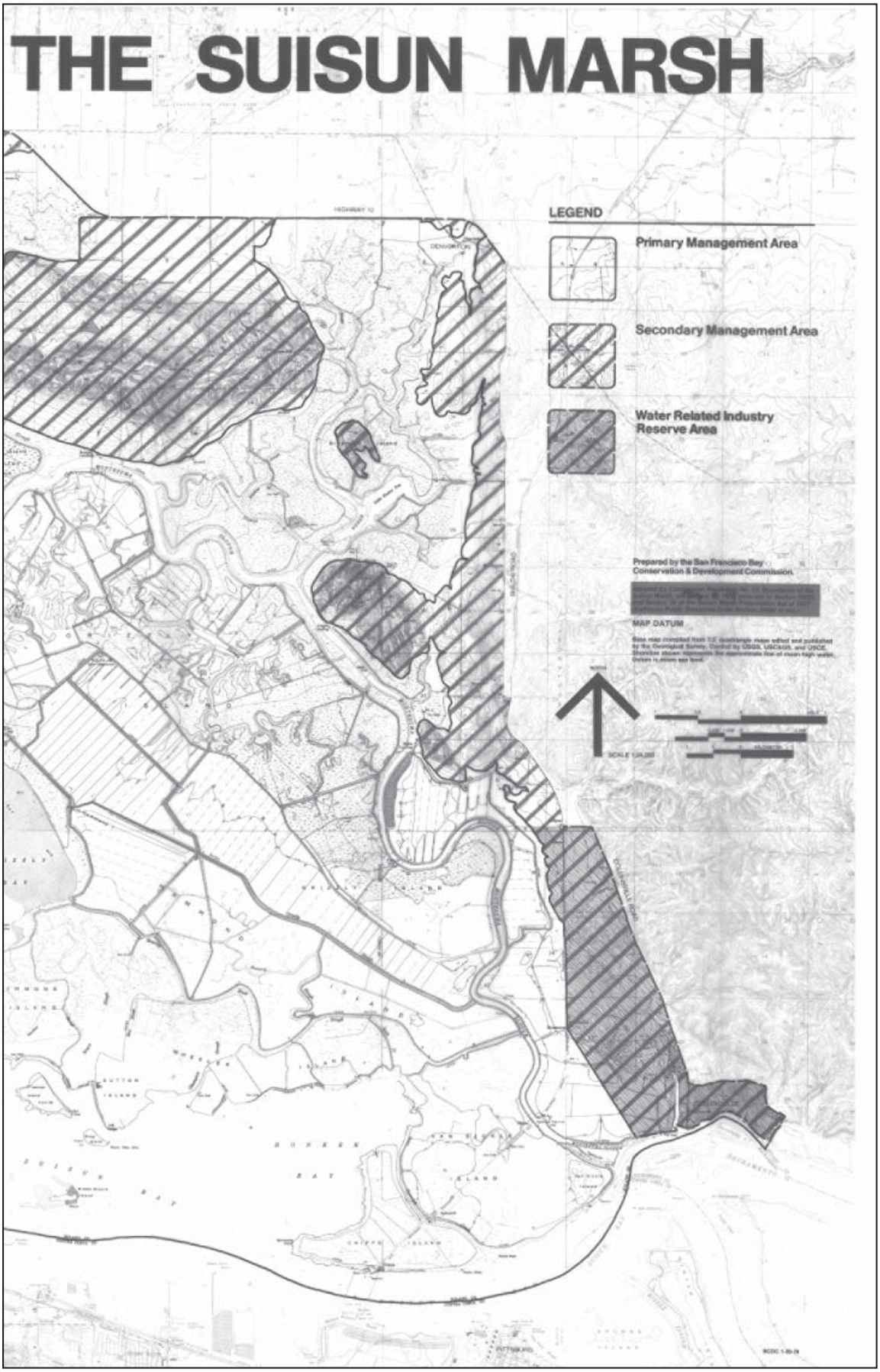
Fairfield
Suisun City
Suisun
Creek
Ledgewood
Creek
McCoy
Creek
Green
Valley
Creek
Thomasson
Jameson
Canyon
Creek
American
Canyon
Creek
Peytonia
Slough
Hill
Slough
POTRERO
HILLS
Beldon's Landing
Slough
ISLAND
Montezuma
JOICE
GRIZZLY
Slough
ISLAND
Suisun
BENICIA
HILLS
Grizzly
Bay
Lake
Herman
Road
WHEELER ISLAND
BYER ISLAND
Suisun
ROE ISLAND
Bay
Benicia
Stake Point


Suisun Marsh
Protection Plan
Natural Factors Map
San Francisco Bay Conservation
and Development Commission
December 1976
Denverton
Denverton Slough
BRADMOOR ISLAND
Little Honker Bay
KIRBY HILL
MONTEZUMA
HILLS
Honker Bay
VAN SICKLE ISLAND
CHIPPS ISLAND
Sacramento
River
CHAIN ISLAND
San
Tidal Marsh
Seasonal Marsh
Managed Wetlands
Lowland Grassland
Upland Grassland
Cultivated
Barren
Landslide Deposits
Bay Mud
Area of High Erosion Potential
Area of High Landslide Potential
Active Fault Location
North
0 Miles
1
2
3


Fairfield
Suisun City
Travis Air
Proposed County Parks (Hill Slough, Beldon's Landing):
Develop passive recreation facilities compatible with Marsh protection (e.g. fishing, picnicking, hiking, nature study). Boat launching ramp may be constructed at Beldon's Landing.
Suisun Creek
Ledgewood Creek
McCoy Creek
Green Valley Creek
80
Interstate
Road
Highway
Cordelia
Cordelia
Jameson Canyon Creek
American Canyon Creek
Thomasson
Peytonia Slough
Railroad
Grizzly Hill Slough
a
b
c
Island
POTRERO HILLS
Road
Beldon's Landing
Pacific
Slough
Cut-off Slough
Unit
JOICE ISLAND
Island
Montezuma
Joice
Slough
GRIZZLY
ISLAND
Suisun
Southern
680
BENICIA HILLS
Interstate
Grizzly Bay
Grizzly Island
WHEELER ISLAND
RYER ISLAND
ROE ISLAND
Suisun Bay
Benicia
Lake Herman Road
Simmons P
Stake Point
Benicia Hills.
Steep slopes with high landslide and soil erosion potentials. Active fault location. Land use practices should be controlled to prevent or minimize earth disturbance and erosion leading to sedimentation in the Marsh.


Suisun Marsh
Protection Plan Map
San Francisco Bay Conservation
and Development Commission
December 1976
Primary Management Area
Secondary Management Area
Boundary of Grizzly Island Wildlife Area
Water-Related Industry Reserve Area
Area Recommended for Acquisition
a Lawler Property
b Bryan Property
c Smith Property
North
0 Miles 1 2 3
0 Kilometers 1 2 3 4
1 Collinsville:
Reserve seasonal marshes and lowland grasslands for their intrinsic value to marsh wildlife and to act as the buffer between the Marsh and any future water-related uses to the east.
2 Collinsville:
Reserve area for use by water-related industry and port facilities. Development should conform to guidelines established in Part II. In the interim, continue extensive agricultural use or enhance or restore wetland resources consistent with Suisun Marsh Protection Plan Water-Related Industry and Land Use and Marsh Management policies.
Chain Island.
Should be protected as a wildlife habitat area and not be affected by any future development in the Collinsville area.
Denverton
Denverton Slough
BRADMOOR ISLAND
Little Honker Bay
KIRBY HILL
Shiloh Road
Sacramento
Northern
Railroad
Birds Landing
MONTEZUMA HILLS
Collinsville Road
Collinsville
Honker Bay
VAN SICKLE ISLAND
CHAIN ISLAND
Sacramento River
CHIPPS ISLAND
Point
San Joaquin
Unit
1
2
12
Amended April 1995


BOUNDARIES OF
CORDELIA ROAD
CONDON
BENICIA


THE SUISUN MARSH
LEGEND
Primary Management Area
Secondary Management Area
Water Related Industry Reserve Area
Prepared by the San Francisco Bay Conservation & Development Commission.
MAP DATUM