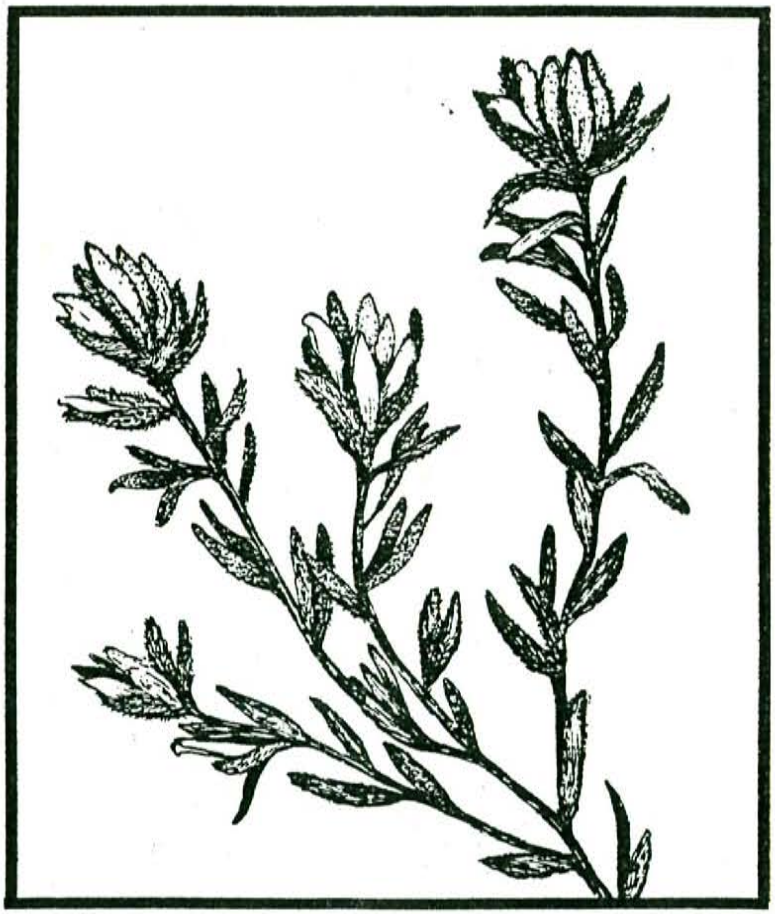
PROTECTING CALIFORNIA'S COASTAL WETLANDS



A PROCEDURAL MANUAL

CALIFORNIA COASTAL COMMISSION

TABLE OF CONTENTS

Appendices:

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1 BACKGROUND

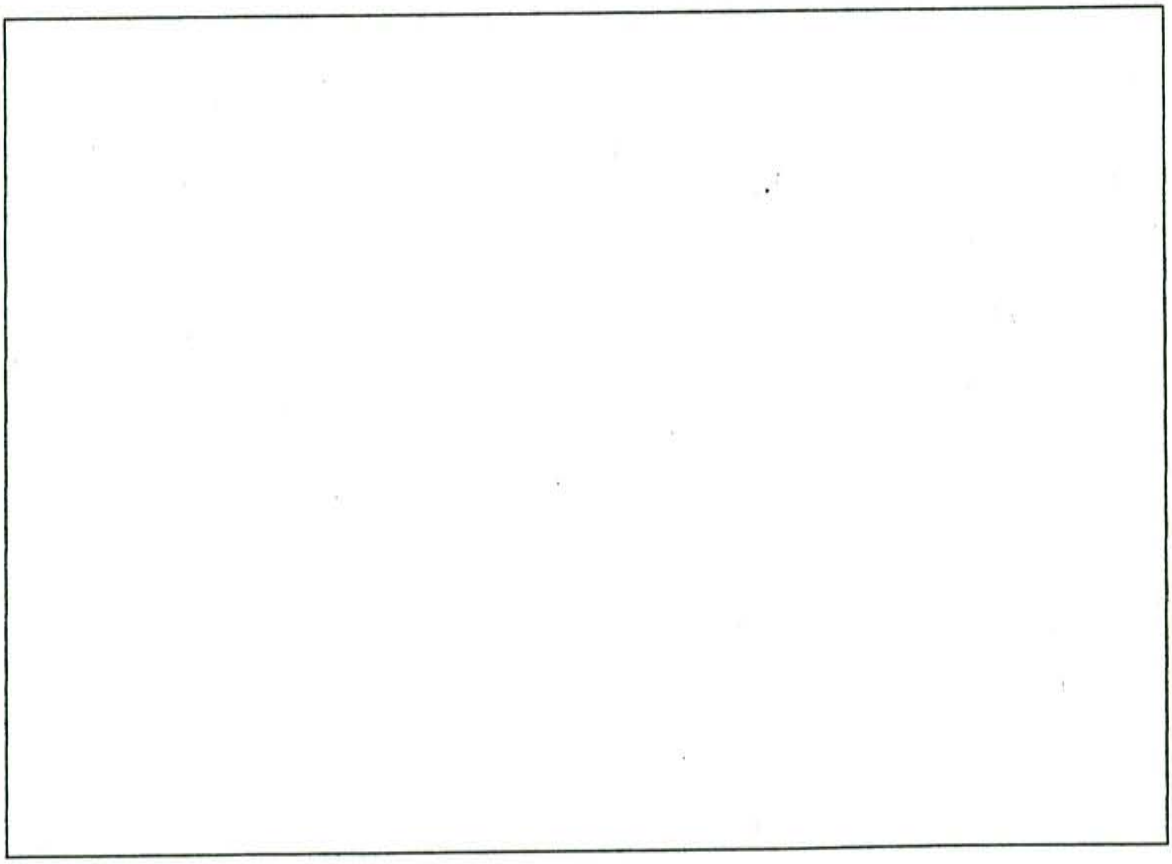
Definition/Classifications of Wetlands

Two of the most difficult wetland planning issues facing a coastal planner are identifying wetland types and defining the exact boundaries of a wetland. This difficulty is due to a lack of general consensus on the part of wetland scientists and wildlife and resource agencies on these two issues central to wetland protection. Some researchers believe the inadequate level of guidance has developed out of a lack of "recognition and appreciation of habitat values, resulting from too few scientists studying wetlands and from too little information reaching planners and politicians."[1]

"Wetland" means lands within the coastal zone which may be covered periodically or pernanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.

Section 30122 of the 1976 California Coastal Act.

This is particularly pertinent to California wetlands. Only recently have California wetlands been studied in enough detail to understand some of the dynamics of these systems. In California's more arid climate, the value of wetlands to fish and wildlife is very



high and this may go unrecognized because of their small area, in comparison to East coast or Gulf Coast wetlands, and their often degraded state.

In an effort to standardize the definition and identification of wetlands, a Federal manual titled "Identifying and Delineating Jurisdictional Wetlands" was published in January 1989. The manual is a cooperative interagency effort amongst the Army Corps of Engineers, U.S. Fish and Wildlife Service, Environmental Protection Agency, and the Soil Conservation Service.

However, because the Federal manual does not fully consider the highly variable wet and dry cycles in Southern California, many of the wetland types in this region are not included in its definition of wetlands.

This confusion over and lack of agreement on acceptable wetland definition has allowed approval of developments in wetland areas and resulted in the elimination of wetlands, such as vernal pools in southern California.[2]

How then does a planner approach the problem of identifying wetlands and their boundaries? First one must be aware that the term "wetland" as used in the Coastal Act and Administrative Regulations encompasses an exceptionally wide range of physical conditions and species composition. Ecologically, wetlands are exceedingly diverse and complex. According to Cowardin, et al, (1979), there is no "single, correct, indisputable, ecologically sound definition for wetlands," because the border between what is dry land and the "wet" environment is not a line: the border occurs gradually in a zone of transition. Since nature does not recognize the notion of "lines", wetland planners should think less in terms of placing a distinct demarcation between the wet and dry and environments and concentrate on the concept of a broad border or buffer, which includes the typical zone of wetland transition.

Each resource agency has developed its own definition of wetlands, some broader and incorporating all possible wetland types into the definition. Since there is no perfect definition, wetland planners should use definitions only as basic guidelines and rely upon the review of each wetland site by a qualified wetland biologist to determine final wetland boundaries. The goal is

not to simply satisfy the parameters of the wetland definition, it is to protect the wetland ecosystem in its entirety.

Better wetland definitions, such as developed by the U.S. of Fish and Wildlife Service (Cowardin, et al, 1979), recognize that the saturation of land (i.e., saturated soils) in a periodic basis results in the formation of particular soils and specialized plants called hydrophytes. Wet soils create physiological problems such as low oxygen for most plants. Hydrophytes have evolved special characteristics which allow them to inhabit this wet ecosystem between dry land and open water. Considering this fact, the U.S. Fish and Wildlife Service definition relies on the presence of one or more of the following attributes in order for an area to be designated as a wetland:

1) At least periodically, the land supports a predominance of hydrophytes;

2) The substrate is predominantly undrained hydric (wet) soil; and

3) The substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

The U.S. Fish & Wildlife Service definition recognizes a basic distinction between deepwater and wetland habitats. Deepwater habitats are permanently flooded lands lying below the boundary of wetlands. In saltwater areas, the separation between wetland and deepwater habitat coincides with the elevation of the extreme low water of spring tide and with other inland wetlands, this separation occurs at approximately 6.6 feet (2 meters) the maximum depth at which emergent plants will normally grow.

According to Wayne Ferren, Director of the Herbarium at U.C. Santa Barbara, this distinction is broad enough to include the special nature of wetlands in most of the coastal areas of California. In conjunction with this definition, the U.S. Fish & Wildlife Service has developed a classification system (Cowardin, et al, 1979) for wetlands which has become widely accepted.

Within this classification system, wetlands are grouped according to similarities in their biological, hydrological, physical and chemical environments. To start with, a planner should concentrate on the five basic wetland systems (Figure 1), which are:

I) **Marine** - consists of open ocean and adjacent coastline.

II) **Estuarine** - consists of deepwater tidal habitats (e.g., Humboldt Bay, Elkhorn Slough) and adjacent tidal wetlands which are typically semi-enclosed with either continuous or seasonal contact with the ocean and are subject to fresh water runoff.

III) **Riverine** - consists of strictly freshwater river and stream channels, and is a deepwater habitat (e.g., Eel River, Santa Maria River, Tijuana River), not including that area influenced by saltwater.

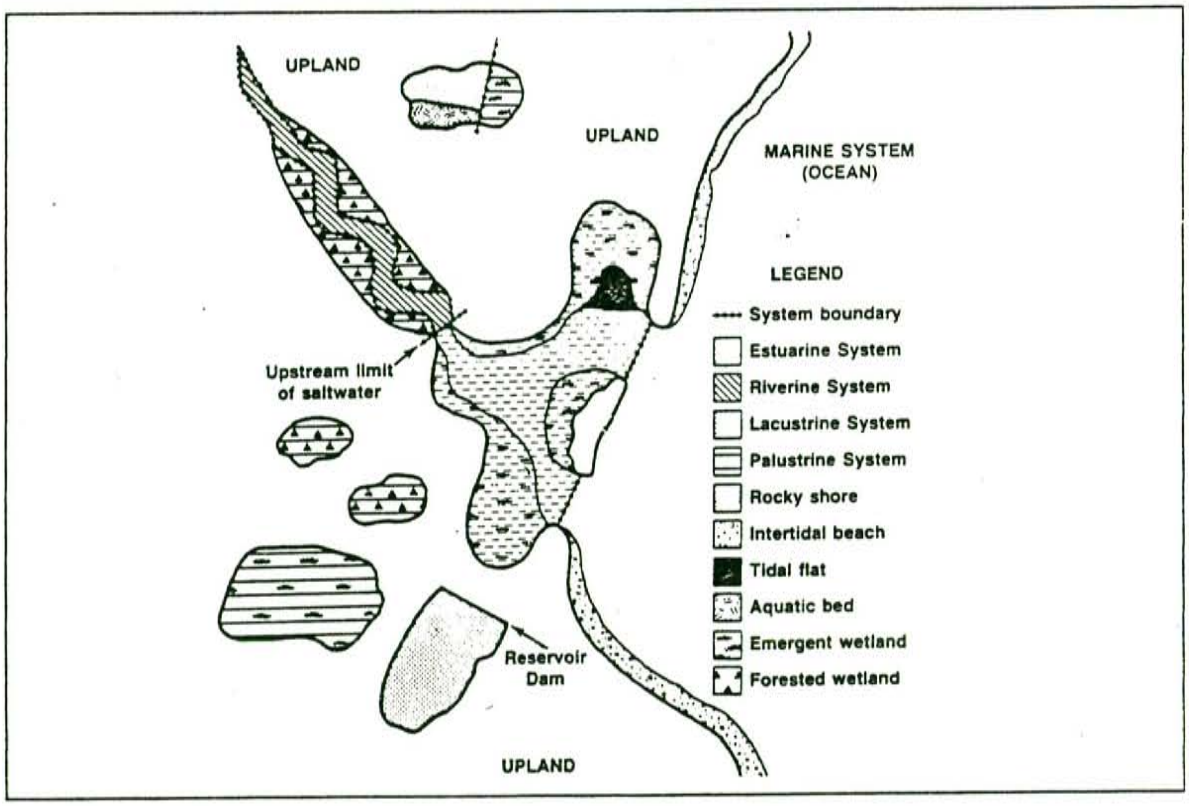
IV) **Lacustrine** - consists of standing bodies of water typically greater than 20 acres in size, such as lakes, deep ponds and reservoirs. Any vegetative cover should not exceed more than 30% overhead coverage of the body of water (e.g., Lake Earl, McGrath Lake).

V) Palustrine - consists of inland freshwater wetlands without deepwater habitat (e.g., Klamath River, Malibu Creek, Santa Margarita River). For the coastal planner, the most important palustrine habitat is streamside or riparian vegetation. The riparian community plays a significant role in chemical, physical and biological dynamics of the coastal wetland ecosystem. However, it is often erroneously considered by coastal planners as non-wetland habitat, and as a result receives a significantly lower degree of protection. More discussion of the importance of riparian ecosystems is presented in this chapter under "Primary Value of Riparian Wetlands."

A photographic example of each of these wetland types is presented in the Appendix, along with a more detailed breakdown of the various wetland types within each of the five major wetland systems.

Characteristics of California's Wetlands

California has the most extensive salt marshes of the three Pacific coast states (i.e., continental United States), totalling approximately 88,956 acres to Oregon's 7481 acres and Washington's 11,075 acres. California's approximately 110 coastal wetlands (Figure 2) represent a diverse variety of habitat types, ranging from tidally influenced river mouths in the north to the many closed, saline lagoons and embayments of southern California. This diversity is primarily due to California's coastline which is located at



the edge of an active continental land mass, where sea level and land elevation are in constant flux.

Most of California's coastline is characterized by a sharp, steeply inclined coast of uplifted marine terraces into which narrow river valleys were cut during the Pleistocene glacial epoch. California's coastal wetlands were created during the last 15,000 years when the rapid rise in ocean level at the end of the last ice age, inundated coastal river valleys.[3] Once the sea level rise subsided, an equilibrium was established between sediments introduced by stream and rivers on the inland side and by sand deposited at the wetland mouth by oceanic long shore transport.

This equilibrium, however, is far less stable than that experienced in East coast wetlands; it is a fluctuating equilibrium which has given rise to wetland species adapted to wide variations in salinity, temperature, and dissolved oxygen. It is essential to understand the system's response to and dependence on these fluctuations when protecting or restoring wetlands. Subtle shifts in the pattern of variation may have major consequences to the biota, especially use of a wetland by juvenile marine species during only part of the year. According to Jeffery Frautschy (Assistant Director, Scripps Institute), "Change is a way of life for a California wetland...Long term stability is both exceptional and unnatural."[4]

Value of California Coastal Estuarine Wetlands

The entire range of values for California coastal wetlands have not yet been determined and scientifically documented. The value of California's coastal wetlands have often been based on the value attributed to East Coast wetlands. These values have included: shoreline buffering to reduce the impact of storm tides and waves; as natural filters to absorb pollutants; as areas in which to absorb floodwater; sources of nutrients for the coastal ecosystem; and as important wildlife habitat.

Though considerable wetland research has been conducted in the last 30 years, the majority of it has concentrated on East Coast wetlands. In the 1970s, management and protection plans for Pacific Coast wetlands often incorporated planning principles that were inappropriate because they were largely based on the characteristics of East Coast wetlands.

Pacific Coast Wetlands differ significantly in several major ways from East Coast Wetlands:

1) Pacific Coast wetlands are geologically young, and experience a high degree of natural instability in their physical, chemical and biological environment.[5] Estuarine wetlands are marine dominated during most of the year, becoming primarily fresh during rainy periods. Furthermore, in some years there can be little to no rainfall, followed by extreme flooding.

2) Pacific Coast wetlands are far less abundant and smaller in size. Generally, they are located at river mouths and along narrow stream corridors which drain directly onto a steeply sloping continental shelf along a slowly emerging coastline. Overall, California has approximately ten percent of the

Figure 2

Major California Coastal Wetlands

wetlands found at a similar latitude on the east coast.

3) Pacific Coast Wetlands play a critical role with the life history of anadromous fish (such as salmon and steelhead) of the coastal watersheds. Pacific coast wetlands also contribute to the support of commercially and recreationally important species. These include:

a) ***Invertebrates***: San Francisco Bay is important to juvenile Dungeness crabs (Cancer magister).[6] Clams are recreationally harvested in many California embayments such as Tomales Bay and Bolinas Lagoon. Due to pollution in San Francisco Bay commercial and recreational harvesting of clams (Mya arenaria) is currently forbidden.

b) ***Fishes - San Francisco Bay North:*** According to Dr. Onuf six to seven per cent (6% to 7%) by weight of the fish species in the 1970 California commercial catch were estuarine dependent, of which salmon comprise the majority of the individuals caught.[7] Dr. Onuf also indicates that the coastal wetlands from San Francisco Bay north to Oregon State play a major role in food chain support for salmon. Within this region, Dr. Onuf also believes that other anadromous species such as the Dolly Varden (Salvelinus malma), eulachon (Thaleichthys pacificus), American shad (Alosa sapidissima), striped bass (Morone saxatilis), and white sturgeon (Acipenser trasmontanus) may depend on food chain support from coastal wetlands.

c) ***Fishes - South of San Francisco Bay:*** In general, environmental and physical conditions in this area result in wetlands which play a different role in the support of coastal fisheries. Because of the narrow shore, embayments are typically small and connected intermittently to the ocean, preventing fish continuous access to the open sea. However, continuing research on central and southern California coast wetlands indicates that wetlands do appear to have a substantial role in "wetland use, benefit, and even dependence."[8] For example, in Central coast streams, juvenile steelhead utilize the lagoons for habitat rearing areas during the summer months. Research indicates that two important commercial species, California halibut (Paralichthys californicus)[9] and starry flounder (Platichthys stellatus), are wetland dependent as juveniles. Juvenile English sole (Parophrys vetulus) are not only found in estuaries in large numbers but are also found in the nearshore open ocean as well[10]. The latter two species are limited primarily to the central coast whereas the California Halibut is common to south coast wetlands.

Seasonal use of wetlands such as the Elkhorn Slough by sharks and bat rays suggests that the central and southern region wetlands may be important to these species,[11] which are becoming increasingly harvested as a seafood. Other species, such as the shovelnose guitarfish (Rhinobatos productus), appear to seek the warmer waters of southern California wetlands, such as Mugu Lagoon, to aid in the development of embryos during the summer months.[12]

4) Pacific Coast wetlands exhibit different primary productivity and nutrient export patterns from those of East Coast wetlands.

Work on California coastal salt marshes indicates that rates of primary productivity are lower for vascular plants and higher for epibenthic algae underneath the open canopy. Research on East Coast wetlands has shown the opposite, with extremely high rates of vascular plant productivity, which in turn supports the basic coastal food chains[13]. Observations of southern California marshes indicate that the hypersaline soils tend to reduce vascular plant cover allowing more light to strike the wetland surface increasing algal and diatom growth (Zedler 1982).

With California marshes it cannot be assumed that nutrients are systematically exported to coastal embayments and nearshore areas. Research has shown that each California marsh is different in regard to export of nutrients.[14] Wetland systems with large river outflows may transport a considerable portion of their primary production or nutrients during spring runoff; those systems with a large range in tidal magnitude may export nutrients year round; small semi-enclosed marshes may recycle the nutrients; and marshes affected by sea level rise may accumulate nutrients in the form of peat.

Primary Value of West Coast Estuarine Wetlands

For most scientists, the most significant values of California coastal wetlands are considered to be their ***existing value as wildlife habitat.*** This includes:

1) Habitat for endangered animal species, such as the light-footed clapper rail, the least tern, Belding's savannah sparrow, and the salt-marsh harvest mouse. Habitat destruction has been the main reason for their decline in numbers.

2) Habitat for rare or endangered plant species such as the Salt Marsh Bird's Beak, etc.

3) Resting and feeding grounds for over one million migratory waterfowl as they travel along the Pacific Flyway to their northern breeding grounds in Alaska and central Canada and southern feeding grounds in Central and South America.[15]

4) Habitat for approximately 240,000 resident birds, including shorebird, waterfowl, wading, and passerine species. This includes ducks, grebes, loons, gulls, herons, egrets, marsh wrens, sparrows, blackbirds, hawks, falcons, owls and ospreys.[16,17] Many of these species breed in the wetland, such as herons, clapper rails, some gulls and terns, American avocet (Recurvirostra americana), black-necked stilt (Himantopus mexicanus), and Savannah sparrow, (Passerculus sandwichensis)[18]

Research on California's coastal wetlands suggests that wintering habitat may be critically short supply in the Pacific Flyway, particularly in the San Francisco Bay Delta region.[19] This observation is supported by comparisons of waterfowl usage of California wintering habitat as compared with other areas. For example, the principal wintering waterfowl area in the Mississippi Flyway, Louisiana, supports similar waterfowl levels as California but in a wetland area 16 times greater.[20]

The lack of invertebrate-rich sandflats and mudflats may limit shorebird populations, particularly in southern California where shallow-feeding shorebirds such as the western sandpiper (Calidris mauri), dunlin (Calidris alpina), dowitchers (Limnodromus spp.), and American avocet (Recuvirostra americana) appear to be most successful feeding on mudflats.[21]

Primary Value of West Coast Riparian Wetlands (Palustrine Forested)

For riparian wetlands, researchers have identified the following primary values:

1) Habitat value for significant number of the state's native species, including amphibians, reptiles, birds, and mammals.

2) Habitat value for anadromous fishes, principally salmonids (juvenile salmon and steelhead).

3) Flood control value, through stabilization of the banks of riverine systems.

4) Pollution filtering which reduces the quantity of pollutants entering the riverine and estuarine ecosystem.

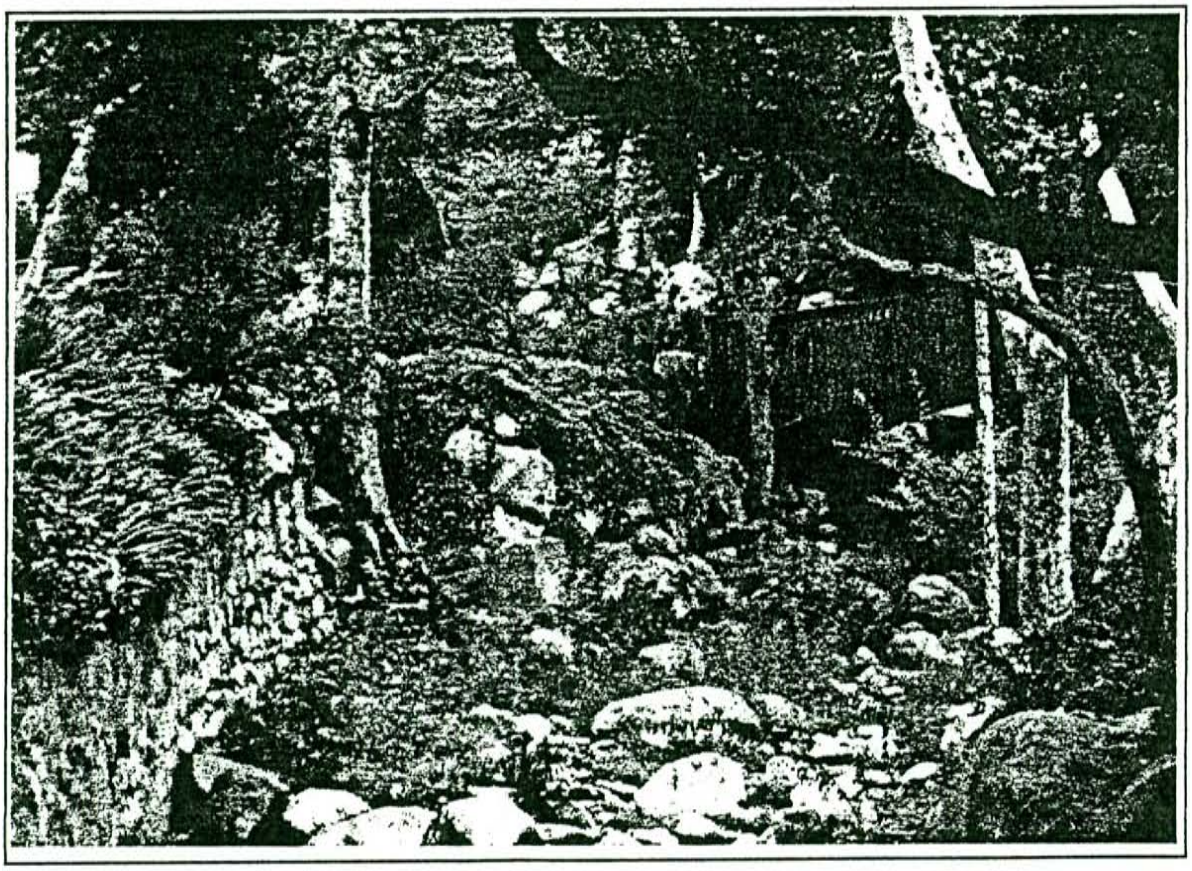
5) Habitat for one out of every four plants listed by the State as endangered or threatened species.

Of the two habitat types identified by the Dept. of Fish and Game, riparian woodland showed the greatest wildlife species diversity. According to Glen Holstein of U.C. Davis, the riparian ecosystems of California are far more productive than any other of the State's plant communities, and they approach the summer season productivity of eastern deciduous forests and tropical

rain forests.[22] Though riparian corridors constitute approximately two per cent (2%) of the State's total vegetative cover, they provide habitat for more than fifty per cent (50%) of its indigenous species.[23] Of the 502 native species and subspecies of land mammals in California (Hall 1981), approximately twenty-five per cent (25%) (133 taxa) are limited to or largely dependent upon riparian and other wetland communities.[24] Additionally, research has demonstrated that of the 120 species of reptiles and amphibians that occur in California, half of the reptile and three-quarters of the amphibian species are associated with riparian systems.[25] California's riparian forests are also noted for the abundance and diversity of their bird fauna, despite their small overall area.[26]

Riparian habitat plays an important role in the survival of anadromous fish. In the upper reaches of riverine systems, the closed canopy of major riparian vegetation provides for the shading of creek waters, which lowers water temperature.[27] The higher water temperatures of unshaded creeks have detrimental effects on the survival of fish populations.[28] Depending on the species, the residence time of salmonid juveniles in the upper riverine system ranges from a few days to several months. During this time they feed on the insects produced in the riparian ecosystem.[29]

Riparian vegetation also provides important flood control benefits by stabilizing stream banks with extensive



root systems, thereby minimizing erosion and delivery of sediment into streams and estuarine wetland systems.[30] River levee studies by the U.S. Department of Agriculture (Enlow and Musgrave 1938) and by the Flood Control maintenance branch of the State Department of Water Resources have recognized the value of riparian vegetation for erosion control (Chaimson, 1981; Murray, Burns, and Kienlen, 1978). The impacts of pollution from adjacent urbanized areas upon instream organisms are also reduced by the riparian vegetation.[31]

Impacts to Coastal Wetlands

During the last century virtually all of the wetland losses in California have been due to human activities. Those activities which will continue to significantly impact wetlands are, in order of severity of impact:

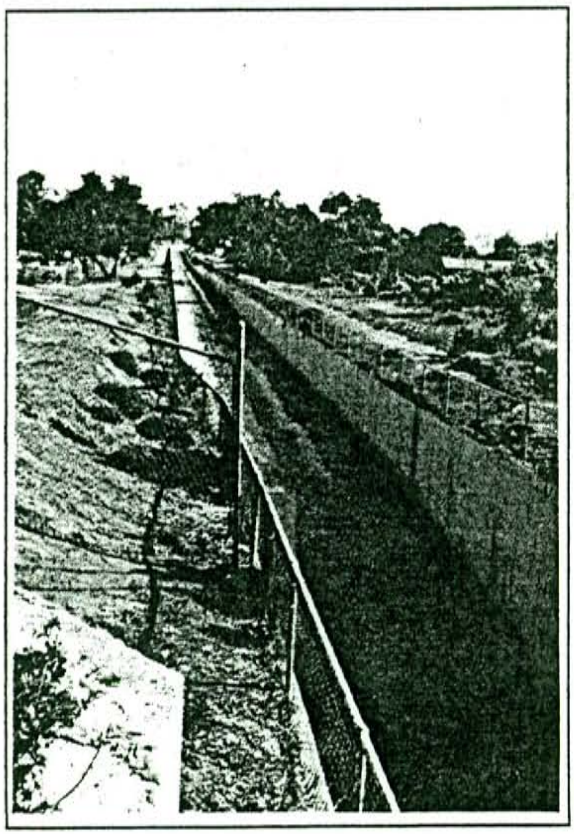
1) ***Agricultural Use and Development.*** Conversion of wetland, including riparian habitat, to agricultural crop lands. This typically involves the diking of wetland areas and the cultivation of the drained lands and/or filling of wetland areas for cultivation and/or removal of riparian vegetation in order to expand adjacent crop or grazing lands. Use of riparian corridors by cattle damages and kills vegetation, as well as destroying banks.

2) ***Commercial and Recreational Development.*** This includes dredging of wetlands for marina or port development and filling of wetlands for large hotel convention centers.

3) ***Residential and Commercial Development.*** Subdivision of land within the watershed of coastal wetlands. In particular, subdivisions in the south coast area of the state have resulted in a significant increase in sediment discharged into wetlands. This is due to the highly erodible nature of the south coast soil coupled with a frequent fire and flash flood cycle.

4) ***Flood Control.*** Development of flood plains has meant that structures are now susceptible to flood damage. Flood control agencies have dredged and channelized wetlands in order to protect these structures.

5) ***Industrial Development.*** Development of business parks, and



light and heavy industrial complexes within and adjacent to wetlands. These facilities often introduce toxic wastes into the wetland habitat.

California is the nation's leader in the destruction of wetland habitat,[32] having diked or filled an estimated 60% to 90% of its original five (5) million acres during the past century.[33,34] Figure 3 give a specific listing of wetland losses in the state. The largest losses have been in the Central Valley, with 94% reduction in historic wetland habitat as the result of agricultural activities.

Due to the concentration of 64% of the State's population[35] in coastal counties, coastal wetlands are primarily impacted by urban and industrial development. San Francisco Bay and Southern California have lost 75% of their original wetland area. San Francisco Bay has lost approximately 162,300 acres of its historic wetlands with only 37,700 acres of the historic wetlands remaining.

Wetland losses in ***Northern California*** have been difficult to document, since no accurate tabulation of original wetland acreage has been made. The principal impact to north coast wetlands has been from agricultural cultivation and timber harvesting. For example, the 27,000 acre Humbolt Bay complex has been reduced to 11,525 acres[36] and the Eel River Delta wetland system has been reduced from 33,000 acres to 6350 acres. However, wetland losses in this region

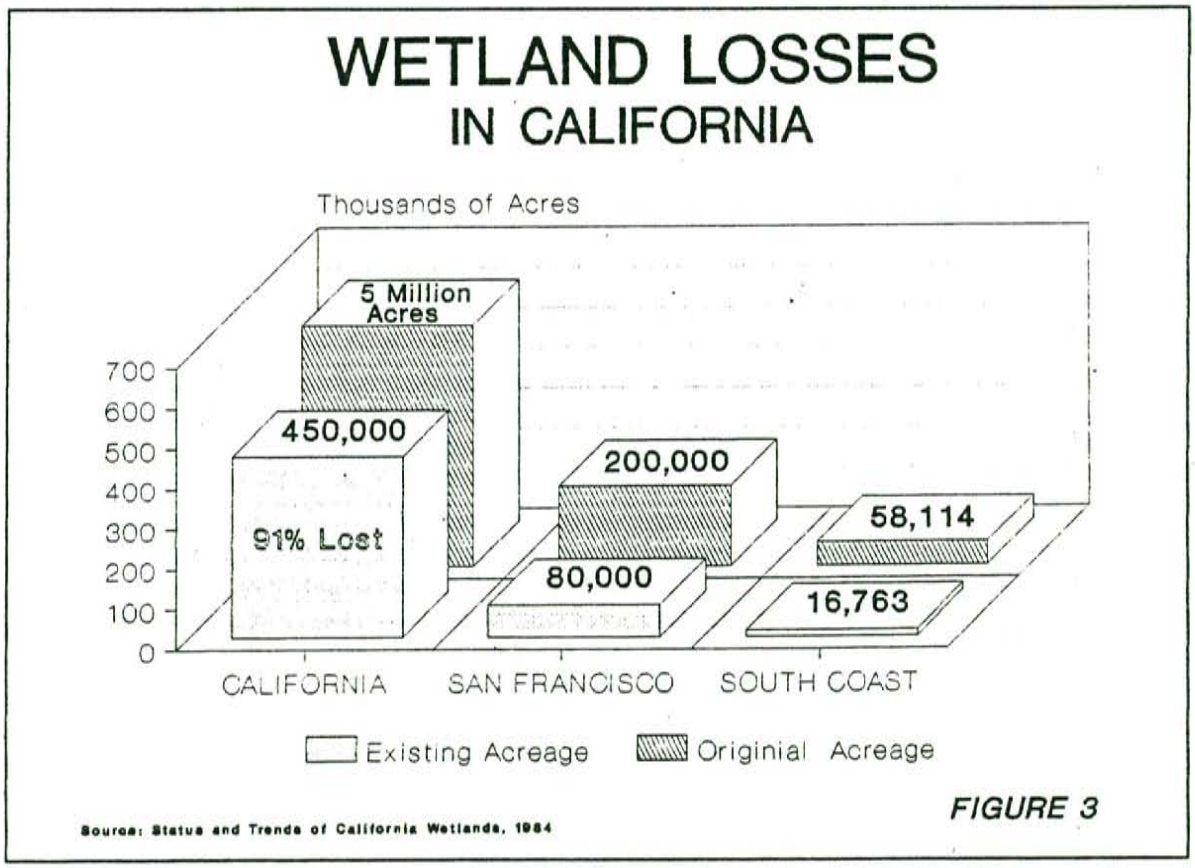


FIGURE 3

are less than those of the more urbanized coastal regions of the state.

Southern California marshes have been filled extensively, with significant marshes such as Mission Bay in San Diego virtually eliminated by marina and commercial development. The Mission Bay wetland area is presently 0.5% of its historic size, representing a reduction of 4500 acres to approximately 25 acres.[37]

Los Angeles and Orange Counties have sustained the greatest wetland losses of any coastal region in the state. According to Speth[38], the Los Angeles coastline was "one of the greatest habitats for wildlife and game birds in the world." Yet, within 70 years constant urban development pressure has reduced this biological showpiece of approximately 38,510 acres to 3976 acres, roughly 10 percent of the original acreage. The remaining acreage is considered by many to be severely degraded and represent nothing more than "museum pieces."[39]

"For California, management is not a matter of wise husbanding of a large and exploitable resource... rather it is a matter of preserving or restoring and maintaining a very meager and severely threatened resource."[40]

San Diego County has suffered a lesser degree of wetland loss than L.A. and Orange Counties. It is estimated that approximately 44% of the San Diego coastal wetlands have been lost. Though development controls are in place for the protection of San Diego's wetlands, extensive and rapid development in wetland watersheds threatens to significantly reduce the remaining acreage through sedimentation.

Management Considerations

As a manager of coastal resources, a planner must make decisions on how to best protect the many values of coastal wetlands. To maximize the values of a coastal wetland is a difficult if not impossible task. Furthermore, management and restoration plans for drastically altered wetlands require an estimation about the historic ecosystem conditions.

According to wetland researchers, most original wetland ecosystems are fragmented into disconnected components, diminishing the original complex web of ecological interactions.[41] The greatest loss has been the elimination or separation of freshwater marshes from tidal wetlands by roads, levees, and embankments. However, these fragmented and remaining portions are still important, representing a "mosaic of natural habitats, all the more deserving of protection and careful management for educational, scientific, and aesthetic purposes because of their proximity to densely populated areas."[42]

Given the still significant values of California's wetlands, including the character of many of them as remnant areas, the planner's basic management goals should be:

1) Protection of wetland areas from impacts, such as:

Stresses on Wetlands:

Besides protecting the limited wetland acreage that remains, a wetland planner should aim to maintain the quality of the wetland's chemical, physical and hydrological components. Even what appear to be minor activities can have very serious wetland impacts. For example, repeated dredging for navigational channels increases the suspended sediment within the wetland, degrading water quality and eliminating mud-dwelling or benthic organisms.

Fill for a roadbed or flood maintenance road can alter water circulation patterns within the wetland to the degree that wetland plants within a large portion of the wetland are deprived of adequate nutrients and oxygen. Pollutants such as fertilizer residue from front lawns and agricultural operations can lead to algal blooms, reducing the oxygen level for wetland waters and result in a die-off of other organisms. Over time, the wetland food chain can concentrate low levels of toxic chemicals from boat hulls, agricultural and urban pesticide runoff residues, and industrial discharges, to a level that is toxic for wetland organisms. This situation typically results in a die-off of wetland organisms.

These impacts work to further stress already damaged wetland systems to a point where the wetland habitat is no longer capable of providing the elements necessary to sustain normal diversity, abundance and growth of wetland organisms.

i) Sedimentation caused by watersheds cleared of natural vegetation for agricultural activities and urban development.

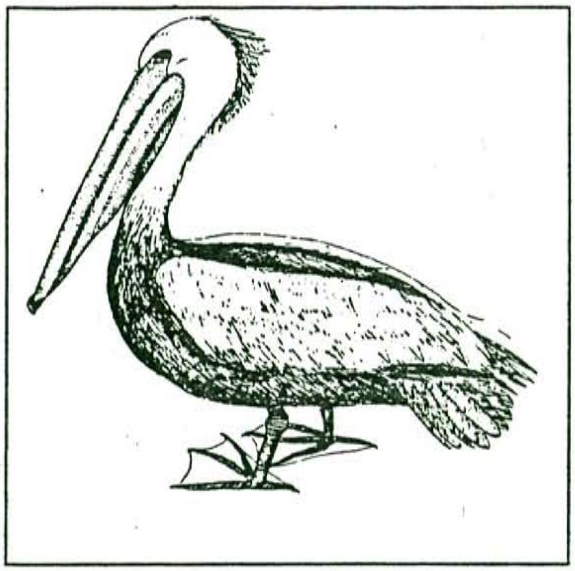
ii) Water pollution from the introduction of agricultural fertilizers, pesticides, sewage effluent, toxic wastes, and runoff from urban surfaces.

iii) Further fragmentation from filling activities for roads, railroad embankments, flood control levees, ecetera.

iv) Alteration of tidal flushing patterns, through activities identified in item iii and from dredging activities.

2) Restoration of Degraded Areas.

3) Provision for the continuation of endangered species through habitat protection and restoration measures.



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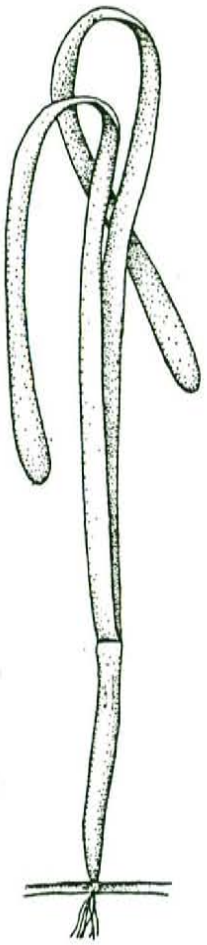

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CHAPTER 2
PROCEDURES MANUAL

Introduction

The intent of this Chapter is to improve staff report consistency and content for wetland permits. This chapter, provides a detailed step-by-step guide to review wetland projects, including a flow chart of each of the steps. This procedural manual also incorporates most of the content of the Wetland Interpretive Guidelines (WIGs), weaving them into a practical "hands-on" framework.

The practical aspects of the manual include:

> model letters for reviewing wetland projects during the Environmental Impact Report (EIR) - Environmental Impact Statement (EIS) Stage.

> recommended checklist forms for reviewing wetland development applications for filing; and

> data base forms for identifying and keeping track of wetland projects; and

For technical issues, such as wetland replacement ratios, designing monitoring programs, and determining uses consistent with Section 30233 of the Coastal Act, refer to specific sections in Chapter 3.

Procedural Manual

Since the Coastal Commission's inception, much has been learned regarding the protection of coastal wetland resources. Experience has demonstrated that effective protection of wetland resources requires considerable time and staff resources in three areas:

1) **Environmental Review - California Environmental Quality Act (CEQA)/National Environmental Protection Act (NEPA) .** The careful tracking of projects in wetlands is required during the environmental review process, which is comprised of three distinct documents, the *initial study*, *notice of preparation* and *draft environmental impact statement.* Involved agencies have an opportunity to review and comment on each of these documents.

2) **Permit Review.** Should involve review of all necessary technical information produced during the Environmental Review period, and the development of appropriate and effective permit conditions, including any necessary monitoring programs.

3) **Post Project Monitoring.** This is the most frequently overlooked area of the wetland permitting process. Without properly designed monitoring projects it is impossible for Coastal Commission staff to determine the effectiveness of various restoration and mitigation measures.

Presently, most efforts are concentrated on area #2, Permit Review, due to limited time and staff resources. The following manual steps cover procedures for areas 1 and 3 in addition to area 2.

STEP 1.0 Environmental Review

Staff participation in Environmental Review is one of the most effective ways to reduce the difficulty of analysis and time spent on wetland permits. By using the Environmental Review process, staff can realize the following benefits:

> **Better Analysis of Wetland Issues and Impacts.** Staff can use the CEQA process to require project sponsors to prepare and complete the information and studies described by the Coastal Commission's Wetland Intrepretive Guidelines prior to application for a Coastal Development Permit. Typically, at the time of application, wetland projects lack all of the studies necessary for complete and adequate analysis of the wetland project. As a result, staff either files the project and works with what it has, or requests new information. Requesting new information/studies at this point of the wetland review can be frustrating to applicants and often leads to efforts to either resist the Commission staff requests or provide a minimal analysis of requested information/data.

> **Better Cooperation From Applicant.** Developers appreciate early identification of wetland issues, required studies, and possible mitigations. In a survey conducted by the Coastal Commission staff in 1986, former applicants identified the lack of assistance on identifying necessary wetland mitigations as a major short-coming with the Commission's permit process. Project feasibility is based, in part, on economics and must be identified early in the process. The earlier a developer is presented with the studies and possible mitigation measures required, the more likely he/she will be to consider such issues in detail during the CEQA/NEPA process. When additional study is required at the Coastal Commission level it may be perceived by the applicant as too late.

> **Reduction in Time Required for Staff Reports and Hearings.** With adequate and early input during the environmental review process, all issues and mitigation can been analyzed and identified. This will allow for easier production of staff reports and less time required for Commission hearings.

The Environmental Review Process at the local governmental level involves three basic steps:

1) The Lead Agency[1] examines the project to determine if it is subject to the California Environmental Quality Act (Section 15061). If the project is exempt, the process need not proceed any further and a Notice of Exemption (Section 15062) is prepared.

2) For non-exempt projects, the Lead Agency conducts an Initial Study (Sections 15063 and 15065 of the CEQA Guidelines) to determine if the project has any significant environmental impacts. If the study shows that no significant impacts will occur, then a Negative Declaration is prepared (Sections 15070-15075).

3) If the Initial Study shows that the project may have a significant effect, the Lead Agency takes the third step and prepares either a mitigated Negative Declaration or an EIR.

Figure 5, presents a flow chart of the process required under the CEQA for review of a development application at the local governmental level. The following steps outline the process for Coastal Commission staff participation in the CEQA environmental review process for wetland projects.

STEP 1.1 Comment on the Initial Study

The Coastal Commission staff has an opportunity at this very early stage to notify the local government and the applicant that certain information, data, and studies are required for projects involving development in wetlands (Section 15063[g]). Additionally, the staff can ensure that the CEQA process considers all environmental issues. Form Letter A and B in Appendix A lists the information that should be requested during review of the Initial Study for large projects such as marina developments and smaller projects such as single family residences.

Discussion, Step 1.1: The first step in obtaining development approval in or adjacent to a wetland, is application for a permit from the local government, special district, or in special cases with the state or federal government. A special district can be a port or harbor district, State College or University, or a Flood Control District. (Where a local jurisdiction has a certified Local Coastal Program, and in some cases, the wetland is located within the local government's original permit jurisdiction, the proposed project will be subject to a local coastal development permit rather than a Commission issued permit.)

The local government or special district must then conduct a preliminary review to determine if the project is exempt from CEQA. Some minor wetland projects such as repair and maintenance of *existing* facilities and mechanical equipment in wetlands (e.g. utility lines and radio/microwave towers) are exempt from CEQA review and qualify for a "Categorical Exemption." CEQA has 29 classes of exemptions listed in sections 15301 to 15329 of the Guidelines (See Appendix B) . Most of these exemptions are for modification and/or limited expansion of existing structures. ***Staff should note that Classes 3,4,5,6, and 11 are not exempt from CEQA review if the project is located in a particularly sensitive environment and significant impacts are expected (Section 15300.2).*** Since local governments are required to list those activities which fall within the Guidelines' exempt classes, each District Office should consult these exemption lists.

If the project is not Categorically Exempt then a brief form known as the Initial Study must be completed for the project. This form consists of a checklist of potential project impacts, with findings as to whether the project impacts, if any, will be significant. The completed form is then sent out to "responsible agencies"[2] which may comment as to the need for further environmental review in the form of a Negative Declaration (ND) or an Environmental Impact Report (EIR).

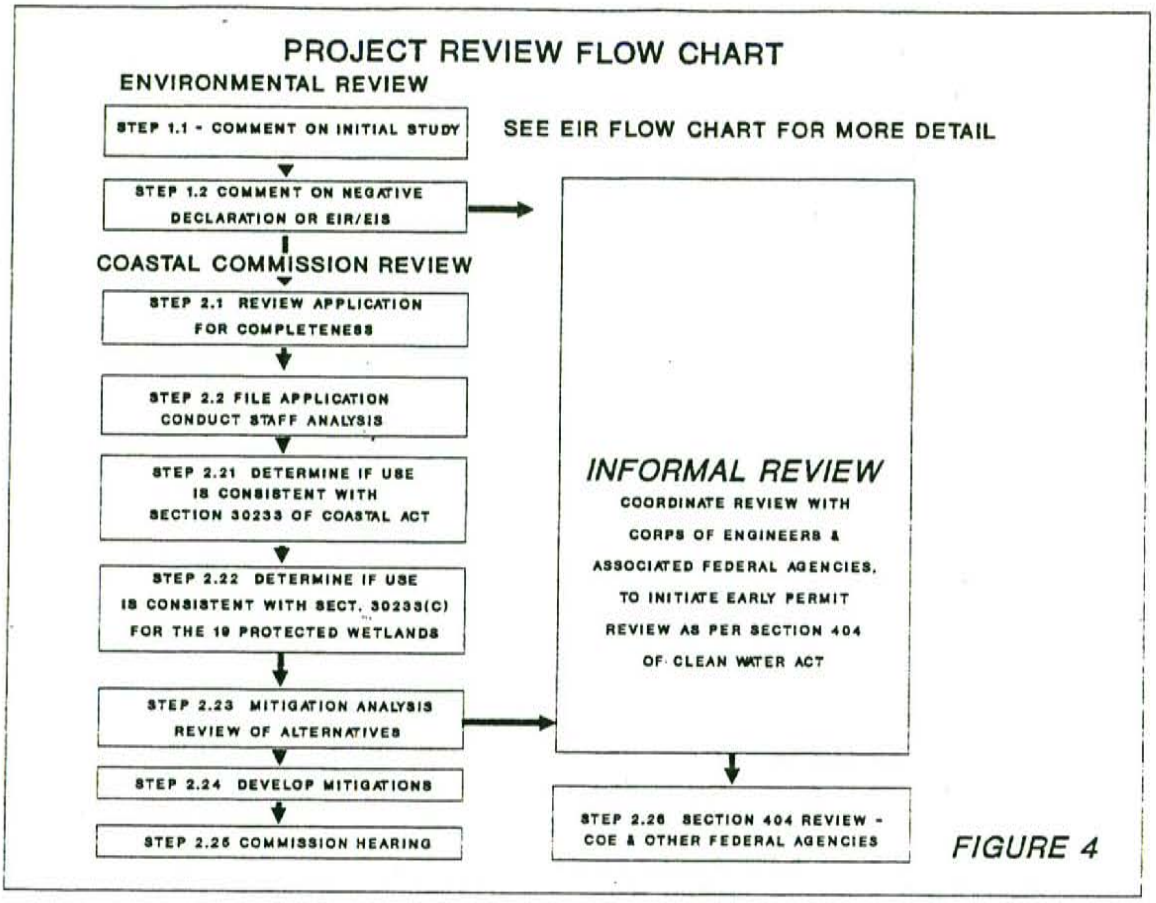

PROJECT REVIEW FLOW CHART
ENVIRONMENTAL REVIEW
STEP 1.1 - COMMENT ON INITIAL STUDY
SEE EIR FLOW CHART FOR MORE DETAIL
STEP 1.2 COMMENT ON NEGATIVE DECLARATION OR EIR/EIS
COASTAL COMMISSION REVIEW
STEP 2.1 REVIEW APPLICATION FOR COMPLETENESS
STEP 2.2 FILE APPLICATION CONDUCT STAFF ANALYSIS
STEP 2.21 DETERMINE IF USE IS CONSISTENT WITH SECTION 30233 OF COASTAL ACT
STEP 2.22 DETERMINE IF USE IS CONSISTENT WITH SECT. 30233(C) FOR THE 19 PROTECTED WETLANDS
STEP 2.23 MITIGATION ANALYSIS REVIEW OF ALTERNATIVES
STEP 2.24 DEVELOP MITIGATIONS
STEP 2.25 COMMISSION HEARING
INFORMAL REVIEW
COORDINATE REVIEW WITH CORPS OF ENGINEERS & ASSOCIATED FEDERAL AGENCIES, TO INITIATE EARLY PERMIT REVIEW AS PER SECTION 404 OF CLEAN WATER ACT
STEP 2.26 SECTION 404 REVIEW - COE & OTHER FEDERAL AGENCIES

FIGURE 4

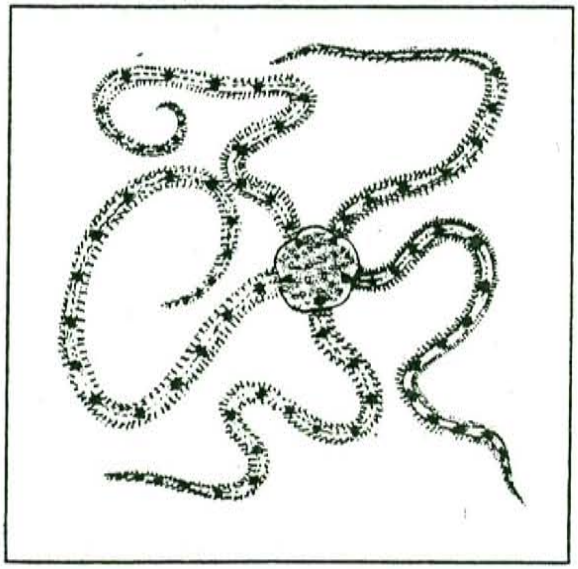
Figure 4 5
CEQA Flow Chart – Still to Come

STEP 1.2 Comment on the Negative Declaration of Environmental Impact Report

If it is determined that an environmental document should be prepared, coastal staff again has an opportunity to comment on the ND during its review period (Section 15073) or in the case of the EIR, during the early stages of its preparation. For EIR preparation, the local government must initially send out a Notice of Preparation to Responsible Agencies and interested parties, which requests input on the scope of issues and the kind of analysis the EIR shall undertake (Section 15082).

Notice of Preparation *(NOP)* - This process provides Commission staff with an additional opportunity to request all of the necessary information, data, studies and analysis required for a complete analysis of environmental impacts (see Form Letter A). Further, it is through both the ND and EIR documents that the analysis of the ***least environmentally damaging alternative*** can be completed. CEQA does not permit public agencies to approve a proposed project where feasible alternatives or mitigation measures which would substantially decrease the adverse environmental effects have been identified. Although CEQA is clear on this point, public agencies sometimes do approve and certify Environmental documents which do not include adequate review of alternatives and which lack mitigations that properly reduce environmental impacts to an insignificant level. Therefore, it is essential for coastal staff to comment during the CEQA process and request review of alternatives and mitigations; otherwise he/she will be in the weak position of requesting additional information after the EIR is completed.

Public Review Period for ND and EIR - Commission staff again have another opportunity to comment during the public review period for the ND (Section 15073) or EIR (Section 15087). However, comments presented at this point may have limited effect and are often responded to in a superficial manner in the appendix of the Final EIR or ND. This is because EIR consultant contracts rarely have sufficient budget for reconsideration and analysis of issues at this point of the EIR review. If there is a major deficiency in the EIR or ND and significant public and agency criticism, the local agency may be compelled to redo the document. But it is usually easier for a responsible agency to get full consideration of important issues at the earlier NOP stage. The public comment stage is mainly useful for correcting minor errors in data and analysis and in establishing an administrative record on which the commenting party may take the lead public agency or applicant to court.



SUMMARY OF STEPS FOR ENVIRONMENTAL REVIEW

To obtain an environmental document that adequately addresses the issues set forth in the Coastal Act and the Wetland Interpretive Guidelines, staff should plan to focus on the Notice of Preparation stage for EIRs. The earlier Initial Study Step allows staff to prevent local agencies from inadvertently preparing a Negative Declaration or exempting the project when a more comprehensive EIR should be conducted.

Problems with the CEQA Process

Tracking developments through the EIR process is difficult when a planner has a multitude of documents, letters, and notices to review. Moreover, public agencies do not always notify all responsible and concerned agencies, including the State Clearinghouse, of pending environmental review. Compliance with notice requirements of the CEQA guidelines requires notifying the State Clearinghouse of the problem and subsequent Clearing-house monitoring of the local jurisdiction.

RECOMMENDED ACTION:

It is recommended that the San Francisco Coastal Commission office enhance its CEQA tracking process, in order to specifically identify those projects in wetland areas and notify the appropriate staff planner. To ease the work load burden on staff, interns could track the list of pending environmental projects and routinely send out the appropriate form letters in Appendix A. District staff should also document violations of the CEQA guidelines noticing procedures and forward the information to the State Clearinghouse

The State Clearinghouse is required to track all environmental documents at each stage of the process. The Clearinghouse, after receiving notices of preparation, exemptions, negative declarations and EIRs, sends lists of these actions and pending documents to other state agencies. In addition, the Clearinghouse has the capability to perform a computer search and list only those projects receiving environmental review in the coastal zone.[3]

A far more difficult problem arises, when local governments exempt projects from environmental review even though they may not qualify for the exemption as specified by CEQA Guidelines. Local agencies are only required to notify responsible agencies *after* they have found the project exempt which makes it difficult for responsible agencies to comment on projects that may significant environmental impacts. The only solution to this problem is a change in the CEQA legislation.

STEP 2.0 Coastal Commission & Local Jurisdiction Permit Review

Proper review of a wetland project requires two important elements:

1) A completed permit application, including the necessary maps, biological/soil/hydrological surveys, ecological and hydraulic studies, alternatives analysis and mitigation/restoration and monitoring plans.

2) Staff analysis of the submitted information, to determine if:

   a. the uses are consistent with Coastal Act Section 30233 (and related LCP policies, where applicable);

   b. the least environmentally damaging alternative is being proposed;

   c. the mitigations proposed will protect and maintain the wetland ecology; and,

   d. it will provide for a successful recovery of lost wetland acreage in the case of a wetland restoration project.

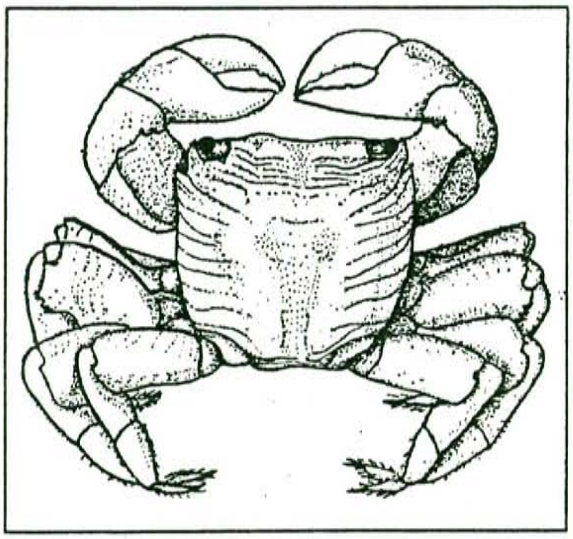
Though seemingly straightforward, successful review of a wetland permit can be an involved and difficult process. Difficulties facing Commission and local jurisdiction staffs include incomplete applications, missing environmental documentation, inadequate studies, uncooperative applicants and limited time to complete staff analysis. Furthermore, with knowledge of the ecology of West Coast wetlands still in its infancy, it is difficult at times to corroborate technical information submitted by applicants.

The following steps seek to streamline and simply the wetland permit review process by providing a relatively detailed account of each step required for processing a coastal development permit for projects within the Commission's original permit jurisdiction. The procedure can also be used in reviewing locally issued coastal development permits.

STEP 2.1 Reviewing an Application for Completeness.

Most wetland applications lack important elements necessary for adequate review. This may occur because staff have been unable to: 1) consistently provide applicants with a complete listing of elements required for Coastal Commission review of proposed wetland development early in the EIR/EIS review stage or 2) notify the local government that an EIR/EIS is required. (See step 1.0).

The following checklist should be used when reviewing a wetland application for completeness. If the application is incomplete, a letter identifying the items missing should be sent to the applicant along with the returned application (Appendix A - Form Letter):



Using the Ecosystem Approach in Wetlands Planning

Wetlands must be viewed as individual ecosystems that require a full complement of critical elements in order to function. These elements can include: a stable watershed that is not subject to high levels of man-made erosion, unpolluted water sources, adequate areas of buffer, upland, transition, lower vegetated marsh, open water, and mudflat habitats in addition to a proper hydrological configuration for the flushing and transport of marsh nutrients/sediment. These elements interact to form a complex environment which supports both a wide variety and a large number of wetland plants and animals. One of the reasons coastal estuarine wetlands support a large variety and number of animals is because it is an area of high productivity, resulting from a relatively rapid exchange of nutrients in the coastal wetland food chain.

For example, in a salt marsh the daily tidal exchange brings in nitrogen and phosphates necessary to the rapid growth of the marsh's algal and diatom communities. Salt marsh herbivores such as snails, crabs and some fish feed directly upon this lower plant community, and they are in turn fed upon by other fish and wetland birds. The larger vascular plants, such as pickleweed, contribute to the food chain through decomposition to detritus by fungi and bacteria. The detritus is consumed by invertebrates such as snails, crabs, isopods, and amphipods. The excretions of the fish, birds and invertebrates within the marsh also contribute nutrients to the system. This food chain model is simplified and still conceptual[4] but begins to illustrate the complex nature of California's coastal salt marshes. Our physical modifications of marshes often disrupt tidal circulation patterns, creating a serious break in the productivity cycle of the coastal marsh. Therefore, analysis of developments within coastal marshes have to carefully examine the impacts to the entire ecosystem, not just site specific impacts.

> **Local Approval and Environmental Review (Regulation 13052)** - Although a form for indicating local approval is included in the CCC permit application, a review of prior CCC wetland permits shows that many applications lack complete local approval or environmental review. Special districts and state agencies frequently overlook this application section. Some state agencies seem to routinely supply an approval form and environmental determination (typically a categorical exemption) after the application is submitted. In addition, environmental documentation is often missing or inadequate; some applicants may submit the Draft ND or EIR prior to final approval and certification of these documents. **All applicants must provide evidence of local approval and a properly approved and certified environmental document (unless legitimately exempt) at the time of application.**

> **Ecological Study (Wetland Interpretive Guidelines Section III [E][2])** - The study should serve as the principal source of

Ecological Study - Why a determination of Functional Capacity (Step 3) is made prior to identification of mitigations (Step 4).

Section 30233 (c) of the Coastal Act requires all diking, dredging and filling projects to maintain the *functional capacity* of a wetland. Therefore, mitigations cannot be used to theoretically lessen the impacts of a wetland project to a level where the *functional capacity* test is satisfied. The purpose of the *functional capacity* test is to ensure that the existing acreage of our existing coastal wetland ecosystems is maintained without subjecting them to extensive manipulation through mitigation programs, including creation of equivalent wetland areas in new locations.

information and impact analysis. If an EIR is prepared, the biological impacts section should contain the same information as required for the Ecological Study (i.e. as outlined in this section). The Ecological Study or EIR must analyze the direct and indirect impacts of the project upon the entire wetland ecosystem and not just the portion that will be filled, diked, or dredged. Its purpose is to show that the marsh shall function as an integrated biological unit and will not be affected over the short or long term. This process involves the following steps:

1) Identify the baseline conditions (biological, physical, and chemical) of the subject wetland and the impacts of the proposed project;

2) Identify the Least Environmentally Damaging Alternative (LEDA), if there are negative impacts to the wetland;

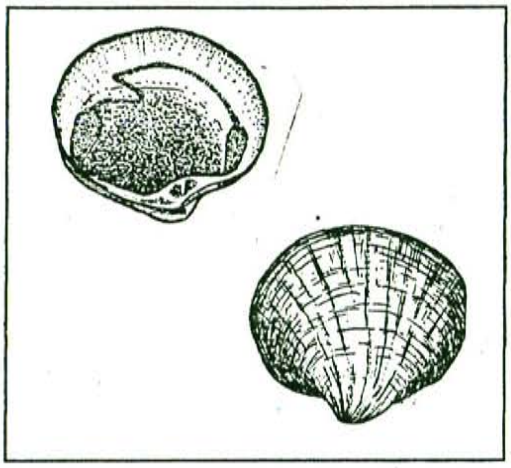
3) Determine if the LEDA, or the project as proposed if there is no LEDA, will protect and maintain the *functional capacity* of the subject wetland (see step 9);

4) Identify mitigations necessary to reduce project impacts to a level where the existing biological productivity and habitat values of the wetland are protected and maintained (Section 30233 and 30607.1, California Coastal Act).

The ecological study must be prepared by qualified ecologist(s) and/or wetland biologist(s) with experience and knowledge in wetland biology/ecology and restoration. It should contain the following informational items (Administrative Regulations Section 13053.5; WIGs III [B][1] & [2]):

1) ***Comprehensive Project Description and Summary of Type(s) of Wetland Habitat*** (See Chapter 1, Definition of Wetlands and Appendix C - Illustrations of Wetland Types).

2) ***Detailed Topographic Base Map(s)*** of the site from recent aerial photographs. The aerial photos should be one to two years old at the most; if older, the photographs must indicate that they have been updated by a field check. Because the distribution, type and frequency of wetland plants is significantly affected by small



elevation changes, contours on the map should be 0.5 to 1 foot. The maps should indicate a specific datum reference, either Mean Sea Level or Mean Lower Low Water. The maps should show the applicant's property boundaries, and adjacent properties, including parcel lines of any tidelands, submerged lands or public trust lands. All parcels should be identified by their Assessor Parcel Numbers.

3) ***Inundation Map*** - For nontidal wetlands, permanent or seasonal patterns of inundation (including sources) in years of low, high, and average rainfall.

4) ***Vegetation Map*** - Extent of wetland habitat and location and names of plant species and vegetation associations, prepared by a qualified biologist(s) (see Appendix D of the WIGs).

5) ***Soil Map*** - If no soil survey is available, a soils map must be prepared by a qualified soils scientist, showing the location of soil types and their physical description (see Appendix D for criteria).

6) ***Development Map*** - The location of the proposed development. This should include, if necessary, the extent and quantity of fill and/or dredging, the type and source of fill and/or dredge spoils, grain size, tests for possible pollutants in fill/dredge material and location of any proposed spoil disposal site. The location and size of any dikes, including the same information required for filling and/or dredging, as well as the location, size, and invert elevation of any proposed culverts or tidal gates. This information should be overlain onto a wetland habitat map.

7) ***History of Site.*** This includes:

a) Collection of older aerial photos and maps.[5] These historic aerial photos and maps should be used to establish, if possible, the previous natural state of the wetland prior to artificial modification. All stages of diking, dredging, filling and any other alteration must be documented.

b) Collection and summary of all available studies of the wetland site. This should include land use studies, environmental documents, Specific Plans, Development Plans, General Plans, Local Coastal Plans, and scientific papers. Identify existing land use policies and any approved plans for the site.

8) ***Description and Analysis of Existing Ecological Conditions*** at the project site, including the

impact of existing development in the wetland watershed. This includes:

a) Discussion of wetland plants, bird and animal use, marine organisms present and their ecological value.

b) Evaluation of potential and existing impacts such as the effect of sedimentation and pollutants from residential, industrial, agricultural, greenhouse and flood control activities in the subject wetland watershed. Also to be considered are detrimental discharges from wastewater plants, industrial operations, and greenhouses.

9) ***Analysis and Discussion of Project Impacts.*** Determine if the project maintains the ***Functional Capacity*** of the wetland and that there will be no net loss of wetland acreage. (See Functional Capacity Box, as follows.)

10) ***Decision Making Matrix*** - Selecting the Preferred Project. The Matrix process depicted in Figure 6 combines the review and analysis of the project and alternatives into a single process and examines the biological and economic feasibility. The developer must perform the analysis, through a series of steps starting with the off-site alternative and ending with the project. The emphasis in the process is on maintaining the functional capacity of the wetland and achieving no net loss of wetland acreage. If any of the alternatives or the project do not meet the *functional capacity* test (Test One of Figure 5) of the matrix, then they are not acceptable under the provisions of the Coastal Act.

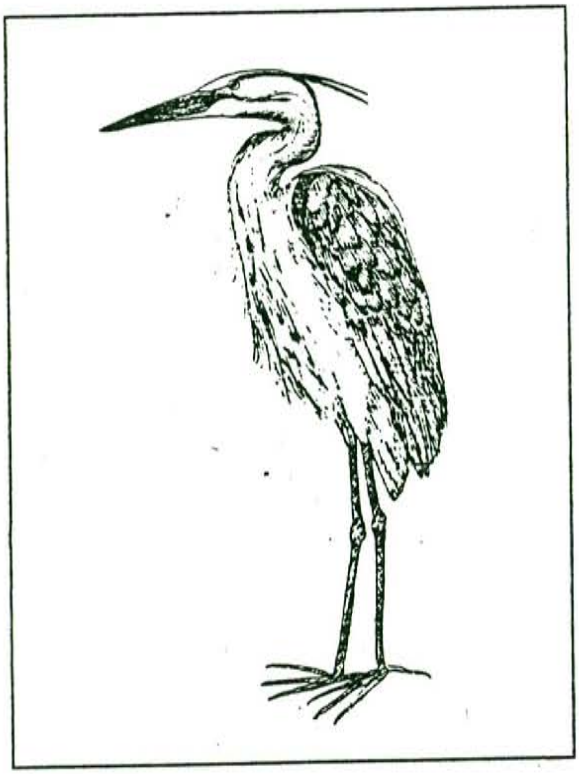
The alternative analysis set forth in the matrix will be used by the coastal staff in STEP 2.2 of this manual. The Alternative Analysis for the Decision Making Matrix should consist of:

a) Review of feasible alternative concepts ranked in order of desirability:

i) location at another site outside of the wetland (several potentially feasible sites should be considered);

ii) reduction of project size, density, coverage; and

iii) reconfiguration of project;



Functional Capacity

Functional Capacity is the ability of a wetland or estuary to be self-sustaining and to maintain natural species diversity. In order to establish that the Functional Capacity is being maintained, it must be demonstrated that:

a) That the project and its impacts will not, over the long term, alter the presently occurring plant and animal populations in the ecosystem in a manner that would impair the long-term stability of the ecosystem.

b) That the project does not harm or destroy a species or habitat that is rare or endangered.

c) That the project does not harm a species essential to the functioning of the wetland, or affect the water quality through sedimentation and or chemical/biological contaminants.

b) Application of the following steps to each alternative:

i) identify the impacts of the alternative to the wetland;

ii) determine whether the functional capacity of the wetland is maintained and that there is no net loss of wetland area - *if the functional capacity test is not satisfied for any or all of the alternative, the alternative analysis cannot proceed to step c)*; and

iii) if necessary, develop a mitigation or restoration plan to maintain the biological productivity and habitat values of the existing wetland.

c) Select the alternative with the highest priority that meets the requirements of steps 2)(a,b,c) and is feasible.

If none of the alternatives are feasible and/or do not meet the requirements of steps 2)(a,b,c) then the project is selected as the preferred projected provided the requirements of steps 2)(a,b,c) are met and it can be demonstrated that the proposed mitigations can be implemented (See Chapter 3, "Criteria for Restoration Plans).

Restoration Plan Criteria

The criteria for developing a restoration plan are set forth in Chapter 3 "Mitigations" under Criteria 1, 2, and 3. Chapter 3 also explains what constitutes acceptable mitigation of wetland impacts, why restoration sites should be located adjacent to existing wetlands and why in-lieu fees and wetland banking programs are generally unacceptable as mitigations.

DECISION MAKING MATRIX

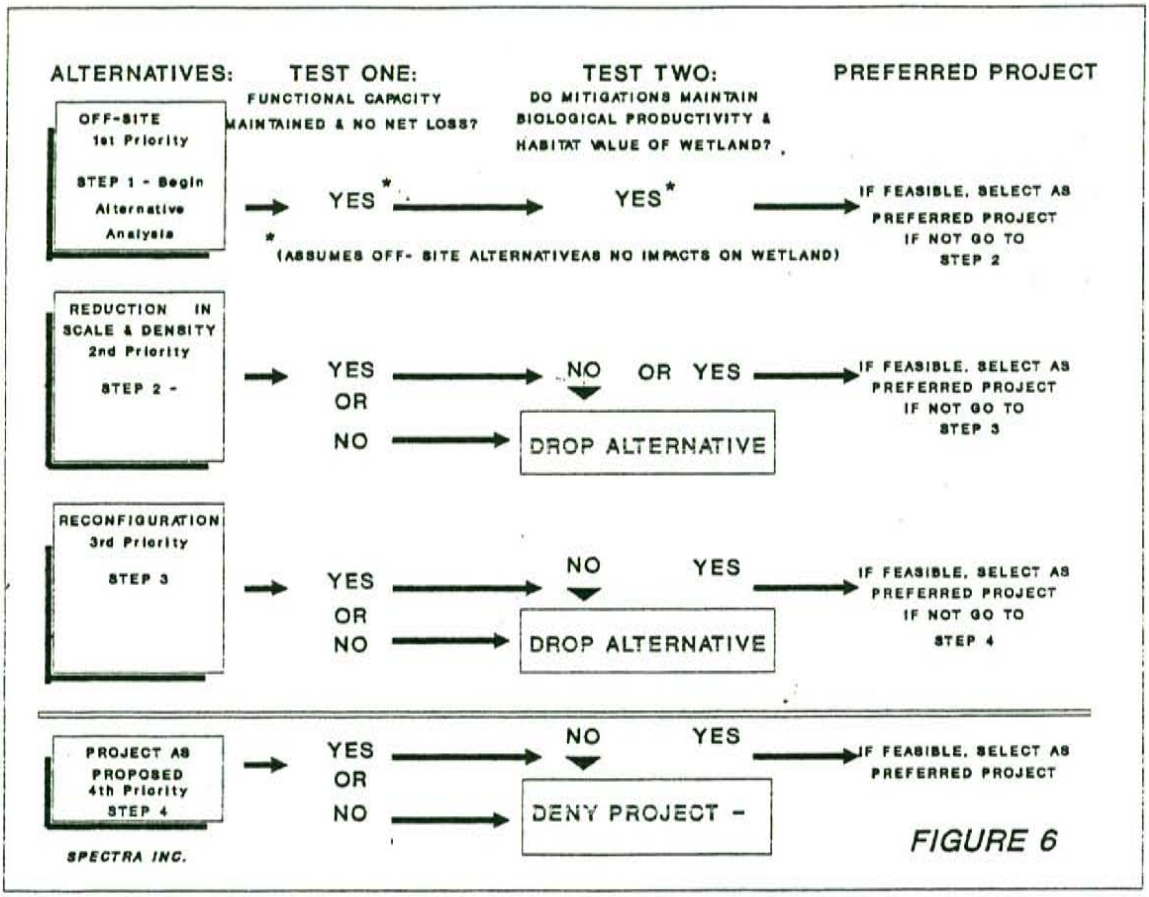
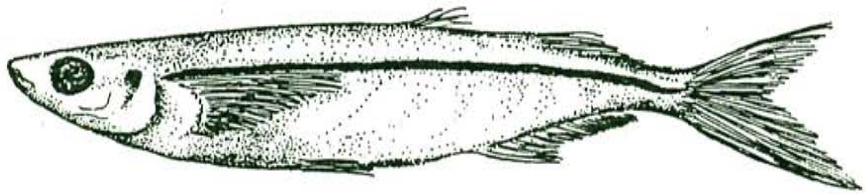


FIGURE 6



Alternative Review Process under Section 404 Guidelines

The Section 404 Guidelines require the preparation of an economic or alternative review process during review of a permit application. An example of the alternative review is the "Attleboro Mall" case, a Section 404 permit application by the Pyramid Companies. Pyramid Companies applied for a Section 404 permit from the COE for a commercial mall. The project design included mitigation measures for the proposed wetland fill of Sweeden Swamp by recreating "comparable" wetland elsewhere on the project site.

The COE took the position that mitigation can substitute for alternatives review and that artificial wetland creation could be considered to eliminate the adverse impact of filling the existing wetland and that there would be "no net loss" of wetland value. The applicant also argued that the COE and EPA should consider the applicant's mitigation measures when comparing project alternatives.

In the "Attleboro Mall" case, there was no alternatives test conducted by the applicant. The EPA staff reviewed different sites and found that there were other comparable mall sites that would not have the adverse impacts to the wetland as would the applicants proposed site on Sweeden Swamp. The EPA found that the alternative sites could be developed with a similar mall concept as to the project site. In summary, the EPA rejected both the COE and Pyramid Companies arguments and found that the Section 404 Guidelines require a consideration of an alternative site(s). The EPA concluded that mitigation is not an alternative, but rather a method to minimize or compensate for the adverse impacts generated by a project and should only be utilized where there are no "practical alternatives."

11) Coordinating Alternative Analysis with the Corps of Engineers (COE) "Section 404" Alternative Review Process -

Though the COE Section 404 Alternative Review Process does not officially start until after the COE files the application (which cannot occur until after issuance of a coastal development permit from the Coastal Commission or the local jurisdictions), considerable time can be saved in the Coastal Commission and COE review period by satisfying the COE Alternative Review Process requirements during the preparation of required CEQA documents (e.g.; Environmental Impact Reports [EIRs]) or included as part of the Coastal Commission Permit Application.

If an adequate alternative analysis is included in the CEQA document, the scope of the project before could be changed before any additional time and investment on the part of the applicant has occurred.

STEP 2.2 Filing Application and Conducting Staff Analysis.

When it is determined that all of the items listed in Step 2.1 are present and

Discussion of Application (Permitted Use #3)

Interpretation of this section may result in the permitting of uses other than boating facilities, such as flood control facilities, which are beyond the intent of Section 30233. This interpretation can arise from the application of Section 30411(b), which outlines a process to study the feasibility of restoring wetlands in conjunction *with boating facilities.* Item 3 of Section 30411(b) states that DF&G must consider during the course of their restoration analysis "whether there are other ways to achieve such values (restoration)." This statement is a reiteration of the Least Environmentally Damaging Alternative analysis required at the onset of the policy stated in Coastal Act Section 30233, and does not allow the consideration of other uses, only other "ways" to achieve restoration objectives. Other ways would include consideration of funding mechanisms such as bonds, mitigation banking funds, land exchanges, purchase by conservation organizations and use of tax credits. Further, section 30411(b)(3) is only one of the criteria that DF&G must consider in its study of feasibility.

complete, the application should be filed and the staff report initiated.

The following items must be covered in preparing the staff report:

STEP 2.21 - Determine if the use proposed is consistent with Coastal Act Section 30233 (WIGs Section IV [A]) or comparable Local Coastal Program policies. If the use is determined to be inconsistent with Section 30233,

findings for denial should be developed. There are eight types of development that may be considered in the majority of California's coastal wetland areas. For the select 19 wetlands (Section 30233[c]) identified by the Department of Fish and Game for acquisition, the uses are even more limited. This STEP will first examine the permitted uses for wetlands and open coastal waters (excluding the 19 wetlands identified for acquisition). These are:

1) New or expanded port, energy and coastal dependent industrial facilities.

Discussion of Application (Permitted Use #1)

A coastal-dependent industrial facility is one which requires a site on, or adjacent to, the sea to function. This includes but is not limited to fish processing plants, icing facilities, kelp processing plants, and oil terminals. (Coastal Act Section 30101)

2) Maintaining existing or restoring previously dredged navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

3) New entrance channels are permitted in non-degraded wetlands when associated with new or expanded boating facilities located outside of the non-degraded wetland area; in degraded wetlands[6] boating facilities are allowed, provided that a substantial portion of the degraded wetland is

restored, and the boating facilities do not exceed 25% of the total acreage of the degraded wetland. Section 30233 indicates that through the process outlined in Section 30411(b), the Department of Fish and Game in consultation with the Coastal Commission and Department of Boating and Waterways may study degraded wetlands and verify those which can be most feasibly restored in conjunction with development of a boating facility.

4) New or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities. These uses are permitted only in open coastal waters, including streams, estuaries, and lakes.

5) Incidental public service purposes including but not limited to burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

7) Restoration Purposes.

8) Nature study, aquaculture, or similar resource dependent activities.

Discussion of Application (Permitted Use #5):

Based on footnote (3), page 10 of the Wetland Interpretive Guidelines, the Commission has allowed for the construction of roads and bridges in wetland areas to address public safety issues. The operative word in this section is "Incidental;" permitting roads and bridges for maintaining traffic capacity generally does not constitute an incidental use. The incidental uses outlined in this section involve only minor temporary impacts to wetlands that will not result in permanent filling.

Discussion of Application (Permitted Use #7):

This use has also been subject to varying interpretations. Paragraph two on page 13 of the Wetland Interpretive Guidelines (WIG) under Section C, presents a case for permitting the filling of "small isolated wetlands" for non-permitted uses, provided that the applicant "provides funds sufficient to accomplish an approved restoration program in the same general region." This approach must be used with caution. Section 30233 does not specifically provide for a non-permitted use, particularly one which destroys wetlands when the stated permitted use is for restoration. Secondly, since wetlands are hard to restore and even harder to create, wetland ecologists encourage planners to work with what they have.[7] To allow a restoration project to fill in degraded wetlands in exchange for restoring or creating new wetlands in another area can result in a net loss in wetland acreage (see Discussion, STEP 2.23 for further explanation). This approach can result in the slow loss of our limited wetland resources.

Discussion of Application (Permitted Use #8):

Aquaculture means the culture and husbandry of aquatic organisms, including, but not limited to, fish, shellfish, mollusks, crustaceans, kelp and algae. Aquaculture does not mean the culture and husbandry of commercially utilized inland crops, including, but not limited to rice, watercress, and bean sprouts. Aquaculture activities can only be sited in a wetland or estuary if they *are dependent* upon the resources of the wetland or estuary to be able to function at all. Support facilities which could be located on upland sites, such as parking lots, and processing buildings, would not be permitted in the wetland or estuary.

Existing agricultural activities are considered by the Coastal Commission as resource dependent uses, but the expansion of farm operations into wetland areas have not been permitted (WIGs). As our scientific knowledge of wetland ecosystems has increased, other plant communities have also been included within the wetland definition. Most importantly, riparian areas have been recognized as wetlands and also as an integral portion of downstream wetland ecosystems.

Further, farm structures are *not permitted* as otherwise indicated in footnote 6, page 11 of the WIG; farm structures cannot be construed as a resource dependent activity, requiring a location on or adjacent to the sea in order to function.

IMPACTS OF AGRICULTURE

Agricultural activities result in thousands of acres of wetland filling and habitat destruction each year in this country. The problem is even more acute given the devastating impact of agricultural wastewaters on the wetland foodchain, as demonstrated in the Kesterson Wildlife Refuge, Salton Sea and Tulare Lake in California, the Stillwater National Wildlife Refuge in Nevada, the Kendrick Reclamation Project in Wyoming, and the Middle Green River in Utah.[8]

STEP 2.22 Determine if Use is Consistent with Section 30233 (c). For the 19 coastal wetlands identified for acquisition, the permitted uses are even more limited than those set forth in STEP 2.21.

The uses permitted in the 19 above listed wetlands are:

1) Very minor incidental public facilities which temporarily impact the resources of the area, such as the inspection of piers, and the maintenance of existing intake and outfall lines (See discussion for permitted use 5, above).

2) Wetland restoration.

3) Nature study.

NINETEEN PROTECTED COASTAL WETLANDS

1) Lake Earl
2) Ten Mile River
3) Big River
4) Bodega Bay
5) Estero Americano
6) Estero de San Antonio
7) Pescadero Marsh
8) Elkhorn Slough
9) Morro Bay
10) Santa Maria River
11) Carpinteria Marsh
12) Upper Newport Bay
13) Agua Hedionda Lagoon
14) Batiquitos Lagoon
15) San Elijo Lagoon
16) San Dieguito Lagoon
17) Los Penasquitos Lagoon
18) South San Diego Bay
19) Tijuana River

4) Commercial fishing facilities in Bodega Bay (the meaning of this phrase is further defined in Section 30233 (c))

5) Development in already developed parts of south San Diego Bay.

STEP 2.23 Mitigation Analysis - Analysis of Alternatives (This step should use the information developed under STEP 2.1 (#11), Decision Making Matrix) -

The mitigation process is a hierarchical one in which the examination of alternatives is an important first step. The following hierarchical framework presented here is based on Section 30233 of the Coastal Act, and the definition of wetlands contained in Section 15370 of the California Environmental Quality Act (CEQA). This is discussed in further detail in Chapter 3, Mitigation.

When it is determined in STEP 2.21 that the proposed use is permitted by Section 30233, then that use is subjected to an alternative analysis (See Figure and WIGs Section IV [D][1]). The principal intent of Section 30233 is to prevent the filling or dredging of wetlands, unless no *feasible*[9] Less Environmentally Damaging Alternative (LEDA) is available for the proposed project. If a LEDA finding cannot be made because of insufficient information (Refer to Step 2.1 #11), the analyst should contact the applicant, inform

MITIGATION PRIORITIES

#1 - Planning to avoid damage to the wetland altogether - Offsite Alternative

#2 - Design & execution of projects to reduce or minimize damage or destruction - Onsite Alternative.

 # 3 - For unavoidable environmental damage, develop a wetland restoration plan or recreate damaged wetland elsewhere

Note: Before mitigation priorities #2 and #3 can be considered, it must be demonstrated that the project design being mitigated will maintain the functional capacity of the wetland.

Discussion of Application, STEP 2.23:

The Alternative Analysis is very valuable, since it requires the analyst and the applicant to view the project from a different perspective, which can often result in the synthesis of creative designs that significantly reduce or minimize project impacts.

Though the finding of Least Environmentally Damaging Alternatives (LEDA) is consistently used at the local level for EIR certification and in Coastal Commission staff reports, the documentation of the LEDA is often lacking. The discussion of Alternatives in EIRs is frequently insufficient and may consist of only a recitation of stock wording. As a result, Coastal Commission staff are often presented with an EIR on a wetland development that does not contain sufficient information to make the LEDA finding required under Section 30233 (See Step 1.2, Notice of Preparation).

If the off-site analysis concludes that there are no feasible sites other than on-site, alternative analysis may develop important mitigations which can be used in STEP 2.23.

The alternatives test is also required by the Section 404 permit application process as established by the Section 404 Guidelines (Corps of Engineers and EPA). As discussed in STEP 2.21 item 10, considerable time can be saved for the applicant if the alternative review is coordinated with the Corps of Engineers.

them of the situation, and indicate that unless additional information is provided, a recommendation for denial will be made. This situation should be avoided by carefully reviewing the permit application prior to filing (STEP 2.1) in order to determine the adequacy of the alternative analysis.

Upon completions of the LEDA analysis, it will be determined whether an alternative project is feasible. If a feasible LEDA is identified, it must also meet the *functional capacity* test of 30233 (c) (see Figure 5). The staff report summary should note the source on which the LEDA analysis was based, such as an EIR, EIS, ND, applicant's report, and/or staff analysis.

STEP 2.24 - Developing Mitigations -

With this step, mitigations will be developed for either an alternative project site, onsite alternative[10] or the on-site project as proposed. In either case, the selected project must maintain the *functional capacity* of the wetland before mitigations can be developed. When a project does not maintain the *functional capacity* of a wetland, the mitigations cannot be used to theoretically create a project which appears to meet the *functional capacity test* (see Chapter 3, Mitigations for more discussion of this issue).

The following guidelines in conjunction with the concept of maintaining the biological productivity and value (Sections 30233, 30607.1) shall apply to

Wetland Mitigations

Since most major wetland developments involve the "filling in" or "dredging out" of habitat area, their mitigation programs have involved restoration of existing degraded, creation of new wetland acreage or provision of an "in lieu fee" for construction of a wetland bank at a later date. This mitigation direction has arisen out of Section 30607.5 which has established that permitted diking and filling activities in wetlands shall include mitigation measures providing for acquisition of equivalent areas of equal or greater biological productivity; or the opening up equivalent areas to tidal action; or an in-lieu fee sufficient to provide an area of equivalent productive value or surface areas. Chapter 3, Mitigations, discusses the application of these various types of mitigations in detail.

the development of appropriate mitigation programs. Additionally, Chapter 3 provides a detailed discussion of mitigations such as restoration, in-lieu fees and wetland banking. Detailed standards for the development of restoration and monitoring plans are also presented.

Mitigation Guidelines For Dredging: Where there is no loss of wetland habitat or values (WIG's IV (D)(2)(a)):

1) Dredging and spoils disposal must be planned and carried out to avoid disruption to wetland habitats and to water circulation.

2) Limitations should be place on the timing and the type of operation, the quantity of dredged material removed, and the location of the spoils site should all be considered in developing mitigations.

3) Dredge spoils suitable for beach replenishment should, where feasible, be transported to appropriate beaches or into suitable longshore current systems.

Mitigation Guidelines For Filling, Diking or Dredging: when there is a loss of existing wetland habitat or value, *a wetland restoration plan* should be prepared (WIG's IV (D)(2)(b)):

1) Wetland Restoration should only occur within lands that *have little or no ecological value.*

   Wetland restoration of degraded wetland area should not be considered as an acceptable mitigation for filling a presently productive wetland area that is beneficial to wetland species (WIG's fn 14), as set forth in sections 30233 or 30607.1. If the degraded area:

   a) Constitutes a locally and/or regionally significant area of upland or transitional wetland habitat;

   b) Contains unique or regionally uncommon plant or animal species;

   c) Serves as an essential ecological component to an adjacent productive wetland area, such as a buffer zone or transitional upland habitat.

When to Use Restoration - Step 2.24.

Section 30607.1 and 30411(b) identify the restoration of wetlands as appropriate mitigation for diking, dredging and filling. However, statewide the restoration of wetlands has generally not been successful. It is difficult to recreate in just a few years what nature has carefully shaped and delicately formed over tens of thousands of years. Therefore, wetland scientists are more cautious about recommending restoration of a degraded site as a ready solution for the filling of an *existing productive wetland area*. Again, the emphasis should be on protecting what wetlands remain, and limiting the use of restoration to those cases were there is no feasible alternative.

2) If restoration is acceptable, a wetland restoration plan shall include a restoration site which:

   a) Can be purchased prior to commencement of the project and dedicated to a public agency or otherwise permanently restricted in use to "open space".

   b) Is located in an area no longer functioning in a manner beneficial to wetland species,[11] such as a formerly productive wetland or estuary which is now biologically unproductive dry land;

   c) Can be restored to "equal or greater biological productivity" (Section 30607.1) than the area lost, with the same type and variety of plant and animal species (WIG's fn.13).

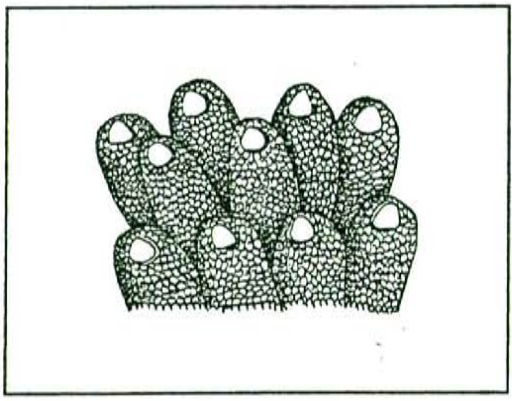
   d) Located in the same general region (e.g. within the same stream, lake, or estuary where the fill occurred.).

3) Specific detailed construction and management plans which:

   a) Clearly identify the habitat values that will be obtained with the restoration site, and time frame within which the restoration will occur;

   b) Establish monitoring and maintenance program which provides for repairs or modifications to the mitigation site, as necessary to ensure that the stated biological values of the site are recognized. This program should include the submission of periodic progress reports to the Coastal Commission;

   c) Commit the applicant and/or developer legally and economically to restoration of the identified site prior to or concurrent with construction of the project.



STEP 3.0 - Section 404 and 10 Permit Review

Section 404 of the Clean Water Act provides the criteria for the filling and depositing of dredged materials in the waters of the United States. The federal agencies responsible for implementing Section 404 are:

U.S. Army Corps of Engineers (Army Corps, the Corps, COE);

Environmental Protection Agency (EPA);

U.S. Fish and Wildlife Service (USFWS), and

National Marine Fisheries Service (NMFS)

The Corps is the principal federal agency involved in regulating development in wetlands and associated habitats through implementation of Section 404 of the Clean Water Act of 1972 and Section 10 of the Rivers and Harbors Act of 1899. A Section 404 permit is required for any operation that would discharge dredged or fill material into any waters of the United States. A Section 10 permit is required for any operation that would excavate in, or locate a structure in, navigable waters or any operation that would transport dredged material for the purposes of dumping it into ocean waters. The Corps permit authority and project responsibilities include,but is not limited to, port maintenance dredging, deep water channel construction, levee construction, flood control, dam construction, and shore stabilization.

Several federal agencies, including the Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS) can strongly influence the Corps Section 404 process. Pursuant to the Clean Water Act of 1972 and the Fish and Wildlife Coordination Act of 1958, the USFWS and the NMFS review and comment on permit applications to other federal agencies in order to protect fish and wildlife resources and to mitigate project impacts.

Even though the EPA does not have direct permit authority over proposed projects located within wetlands, as does the Corps, the EPA has the ability to "veto" Corps approved Section 404 or 10 permits if the Administrator of the EPA determines that the Corps has not addressed or protected all resource concerns. It should be noted, however, the EPA rarely invokes its veto authority.

The USFWS review focuses habitats for fish and wildlife, especially those which are scarce and of high value. The USFWS is also responsible for implementation of the Endangered Species Act for marine birds and mammals .except the Southern Sea Otter, and the Migratory Bird Act. The Endangered Species Act requires all applicants, whether public agencies or private developers, to consult with the USFWS if a proposed development may affect the habitat of an endangered or threatened species.

The NMFS reviews federally permitted projects which have the potential of altering aquatic habitats, with specific emphasis on the protection of living marine resources, including anadromous fish and marine mammals.

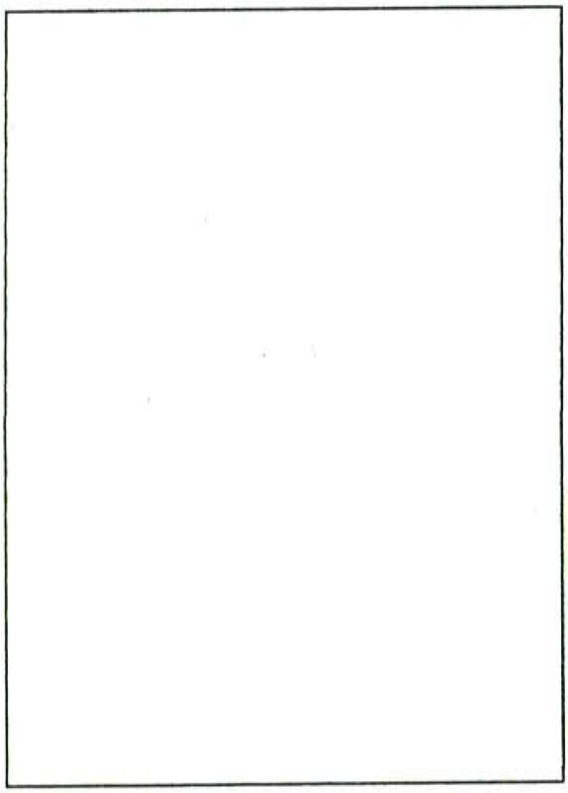
If either the USFWS or NMFS determines that a project "may affect"

an endangered or threatened species, they will write a formal opinion which may contain mitigations which will alter the project. It is important to obtain this document, if at all possible, before filing the application.

Section 404 Guidelines

The Guidelines are contained in Part 230 of Title 40 , Code of Federal Regulations (CFR) - Guidelines for Specification of Disposal Sites for Dredged or Fill Material (dated December 24, 1980).

Section 404(b)(1) requires the EPA, in conjunction with the Corps, to prepare Guidelines for regulating the discharge of dredged or fill material into the waters of the United States. "Waters" are considered to be all streams with flows of five (5) cubic feet per second average annual water flow, lakes over ten (10) acres, and contiguous wetlands, including those above the ordinary high water mark in nontidal waters and mean high tide in tidal waters.



The 404 Guidelines provide the substantive criteria in evaluating discharges of dredged or fill material. The Section 404 program involves several subsections, but the ones highlighted by the Guidelines include:

1) Section 404(b)(1) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits specifying disposal sites in accordance with the Guidelines.

2) Section 404(b)(2) allows the Secretary of the Army to issue permits otherwise prohibited by the Guidelines, based on consideration of economics for anchorage and navigation.

3) Section 404(c) authorizes the Adminstrator of the EPA to prohibit or withdraw a specified site if use of the site has unacceptable adverse effects on municipal water supplies, shellfish beds or recreational areas.

The 404 Guidelines specify the tools to be used for evaluating and testing the impact of dredged or the discharge of fill material on the waters of the U.S.. The Clean Water Act prohibits the discharge of dredged or fill material except in compliance with Section 404. Section 404 establishes a procedure for issuing permits specifying discharge sites. Certain disharges are exempted from the permit requirements and are identified in Section 404 (f) and (r).

Section 404 (b)(1) represents the substantive criteria for dredged and fill material disharges. The Corps also conducts a Public Interest Review, which ensures that the discharge will comply with the applicable requirements of other statutes and is in the public interest. However, if the Corps concludes that the disharge does not comply with the Guidelines, it may still issue the permit under Section 404 (b)(2) if the Corps determines that the economics of navigation and anchorage warrant approval.

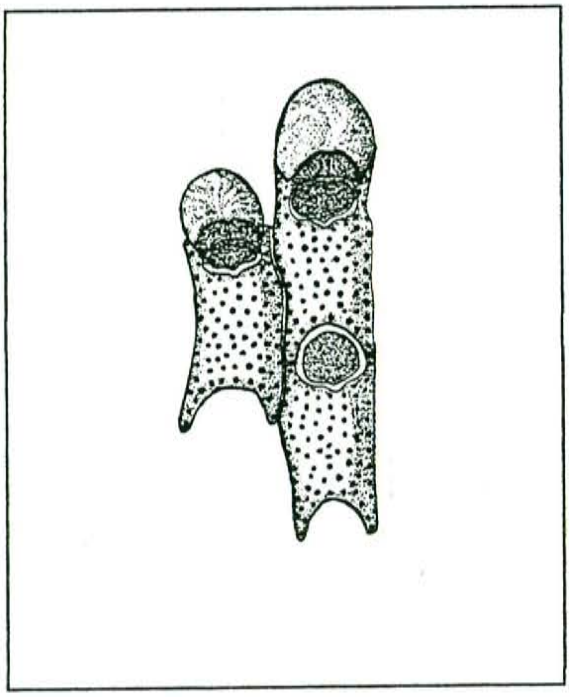
The EPA's role under Section 404 is several-fold. First, the EPA has the responsibility for developing the Guidelines in conjuntion with the Corps. Secondly, the EPA reviews the permit application and provides comments to the appropriate Corps District Office. The Corps may issue a permit even if the EPA has provided adverse comments. However, the EPA Adninistrator may prohibit the specification of a discharge site or restrict its use by following the procedures set forth in Section 404 (c). If the Administrator determines that the discharge would have an unacceptable adverse effect on fish and shellfish areas, municipal water supplies, wildlife or recreation areas, the Administrator may veto the issuance of the Section 404 permit. Where the Administator has exercized his Section 404 (c) authority to prohibit, withhold, or restrict the specification of a site for disposal, the Administrator's action may not be overridden under Section 404(b)(2).

The Clean Water Act provides for several uses of the Guidelines in addition to the indivdual permit application review described above. The Corps may issue General permits where the Corps determines, based on the Section 404 (b)(1) Guidelines, that the activites will cause only minimal adverse environmental effects both individually and cumulatively.

During the review period for the Guidelines, it became apparent that there were a number of Federal and State laws, regulations, and programs which have developed slightly different wetland definitions. Some of the variations to the wetland definitions accommodate or emphasize specialized needs. Some definitions include, as part of wetlands, mud flats and vegetated and unvegetated shallows. The Section 404 (b)(1) Guidelines group these areas as "Special Aquatic Sites" and as such, their value is given special recognition. The EPA recognizes that the National Inventory of Wetlands, prepared by the USFWS, does not exactly coincide with

the scope of "waters" of the United States as defined by the Clean Water Act or wetlands as defined under these regulations, but helps to avoid construction in wetlands and serves as a useful long-term planning tool.

Of concern is whether the EPA and the Corps incorporate Coastal Zone Management Plans (CZMP) in their review of wetland projects. The Corps and EPA have indicated that they will not accept an application for filing unless a coastal development permit has been appproved, or that the applicant furnishes evidence that the project is consistent with an approved Coastal Zone Management Plan. That means a coastal development permit must be approved by the Commission, if not yet "issued" because the applicant has not yet complied with the required conditions attached to the permit. The Corps and EPA do not make findings of consistency to CZM Plans, because these findings of consistency would be made during local or state review of the proposed project.



Part 230 of Title 40 CFR -

Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

Part 230 provides the cornerstone for review of Section 404 applications, just as Chapter 3 of the Coastal Act provides the basis for project review in the Coastal Zone. A brief overview of the eight subparts of Section 230.4 - Organization is provided below:

Subpart A presents general provisions of applicability, such as purpose and definitions.

Subpart B establishes the four conditions which must be satisfied in order to make a finding that a proposed discharge of dredged or fill material complies with the Guidelines. Section 230.11 of Subpart B sets forth factual determinations which are to be considered in determining whether or not a proposed discharge satisfies the Subpart B conditions of compliance.

Subpart C describes the physical and chemical components of a site and provides guidance as to how proposed disharges of dredged or fill material may affect these components.

Subparts D-F detail the special characteristics of particular aquatic eco-systems in terms of their values and the possible loss of these values due to discharges of dredged or fill material.

Subpart G prescribes a number of physical, chemical, and biological evaluations and testing procedures to be used in reaching the required factual determinations.

Subpart H details the means to prevent or minimize adverse effects.

Subpart I concerns advanced identification of disposal areas.

Section 404 Guidelines closely resemble the wetland resource policies of Chapter 3 of the Coastal Act. A common complaint of project proponents (developers) is that permit application review appears to be duplicative, from the local jurisdiction on through the state and federal levels. Although, local, state, and federal agencies share common objectives, they have differing responsibilities and priorities which afford wetlands differing levels of protection, and in some cases, may emphasize the protection of different individual wetland species.

1 "Lead Agency" means the public agency which has the principal responsibility for carrying out or approving a project. The Lead Agency will decide whether an EIR or Negative Declaration will be required for the project and will cause the document to be prepared.

2 "Responsible Agency" means a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared and EIR or Negative Declaration.

3 Glenn Stober, Office of Planning Research 5/26/89

4 Zedler, J.B. *The ecology of southern California coastal salt marshes: a community profile.* U.S. Fish & Wildlife Service Report OBS-81/54, 1982.

5 The University of California Remote Sensing Library at Santa Barbara is an excellent source for locating such documents.

6 As defined and established by the Department of Fish and Game pursuant to the procedure established in section 30411(b) of the Coastal Act.

7 Zedler, Joy, *salt marsh restoration* pg. 10, item #3. Cal. Sea Grant Report No. T-CSGCP-009.

8 Ferrell, J. E. *The 100% Solution* L.A. Times Magazine, May 28, 1989

9 "Feasible" is defined in Section 30108 of the Coastal Act as ".. capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." So feasibility is not limited to just the economic considerations of the developer and must equally consider the cost of recreating the wetland environment proposed for fill/dredging as well as the overall impact to the larger wetland ecosystem.

10 Some of the mitigations may have been identified during STEP 2.22

11 This can include the opening up of areas to tidal action, which are not environmentally sensitive and would result in a wetland that has a level of biological productivity equal to that of the existing removed wetland area.

CHAPTER 3 - MITIGATION

Introduction

The concept and definition of mitigation has been difficult for regulators and the public to understand and apply in a consistent manner. The term Environmental Impact Statement or Report, immediately suggests "mitigation." Many applicants consider the provision of mitigation measures as a *justification* for a project, regardless of type and degree of habitat impact. This attitude has fostered an automatic inclusion of some type of compensation for lost or damaged habitat, by the developer in the development design. Typically, developers favor wetland enhancement or creation because it fits well within our society's concept that you can replace something that has been lost or damaged; further, with this approach one can easily show that the wetland acreage restored is equal to wetland acreage loss, so the damage has been offset.

This concept of adequate mitigation often fails to recognize the complexity of the wetland ecosystem, its interconnection to lands within their entire watershed, and our lack of long-term knowledge regarding the actual value of restored or created wetland ecosystems.

Developers, however, still find the environmental and permit review process within aquatic habitats to be too confusing and inflexible and urge the use of a broader range of mitigation techniques. Environmental groups find that mitigation has resulted in the continued net loss of wetlands, and should only be permitted if a net gain in functional wetlands is recognized.

Consequently, less emphasis should be placed on mitigation and more on the scientific and planning process of identifying the overall environmental requirements of a wetland in order to determine what will keep it functioning over the long term. The aim is to switch the perspective from one of permitting the development at any cost, to protecting a very valuable and diminishing resource.

Section 15370 of the California Environmental Quality Act defines mitigation[1], as:

a) Avoiding the impact altogether by not taking a certain action or parts of an action.

b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.

d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e) Compensating for the impact by replacing or providing substitute resources or environments.

These examples of mitigation can be summarized and condensed into a sequential process of three Mitigation Levels for review of development in wetlands:

1) planning to avoid damage to the wetland altogether;

Functional Capacity.

The concept of maintaining the biological integrity of a wetland ecosystem is expressed in Coastal Act section 30233(c) as "*Functional Capacity*":

"Diking, filling or dredging shall maintain or enhance the functional capacity of the wetland or estuary."

For projects proposing Level 2 Mitigation Plans, it must be demonstrated that the functional capacity of the wetland will not be affected. A Level 3 mitigation plan is permissible if the *development can first demonstrate that it will not affect the functional capacity of the wetland without the Level 3 mitigations.*

The Level 3 mitigations should not be used to create a functional capacity that is equivalent to that of the existing wetland before development. Level 3 mitigations are intended to replace those habitat values that will be lost as a result of the project.

2) design and execution of projects to reduce or minimize damage or destruction; and

3) for unavoidable environmental damage, restore the damaged wetland or attempt to recreate it elsewhere ("compensatory mitigation.")

As set forth in Permit Procedural Guide in Chapter 2, the primary standard for evaluating a development is whether or not loss of wetland value and acreage can be avoided and the ***functional capacity*** of a wetland is maintained. The applicant should go through each of the above mitigation planning steps sequentially. *The emphasis is on avoiding wetland impacts.* If avoidance is demonstrated to be infeasible then redesign or reconfiguration of the project to reduce impacts to an insignificant level may be considered. Again, the goal should be the avoidance of *any* loss of wetland acreage and value and maintenance of the functional capacity of the wetland. Level 3 mitigations should be considered measures of last resort and only if there are no other feasible alternatives and it is demonstrated that the proposed development will maintain the functional capacity of the wetland.

If Level 3 mitigations are found to be acceptable, then a restoration plan

The concept of *Functional Capacity* is rarely mentioned in staff reports or considered in Environmental Documents and /or ecological studies for wetland development. Yet it is probably the most important determination to be made during the analysis of the project. It assists staff in determining whether a development will diminish the overall capacity of a wetland to function as an integral ecosystem, by maintaining the same level and numbers of species as well as the same level of biological productivity.

Since the determination of Functional Capacity is a scientific one, it must be made by a qualified ecologist in a study submitted as part of the application to the Coastal Commission or as part of the Environmental Document. Therefore, it is important that Functional Capacity Analysis is part of the application materials, prior to filing.

should be completed. This plan must be developed prior to final permit review by the lead agency. The plan is designed to answer specific questions regarding the adequacy of the Level 3 mitigation proposed and overall consistency of the proposed development with the policies of the California Coastal Act. A detailed discussion of Restoration Plans and recommended criteria for their development is presented in the following sections.

In-Lieu Fees & Wetland Banking

The provision of in-lieu fees and wetland banking is generally considered inappropriate mitigation, due to the very poor track record of these mitigation schemes. If a developer is having difficulty in locating an appropriate site for mitigation, and proposes an in-lieu fee, the problem of locating a proper site has only been avoided or transfered to a public agency. Further, in the competitive coastal real estate market, delay in purchasing property means that even higher prices will have to be paid for a suitable restoration site. Planners nationwide have observed that major conditions on developments, such as land restoration work best if the applicant is required to satisfy the condition in full *prior* to initiation of development. This requires that a detailed, feasible restoration/creation plan with an acceptable site in the ownership of the applicant, be included as part of the permit application. Given the high level of uncertainty associated with the science of restoring and creating wetlands, feasible restoration plans that can be implemented on an existing parcel with the applicants ownership, should be given higher priority than an in-lieu fee.

Where Restoration Can Occur

Once it is determined that there are no feasible alternatives to a proposed project located within a wetland, a suitable site for restoration should be identified. This is probably one of the most difficult tasks facing both the applicant and the permit analyst. In many cases, when the CEQA environmental review process determines that there are no feasible alternatives, it does so without a specific, scientifically based evaluation of the type or quantity of replacement habitat required to offset the project

impacts. Because of a lack of data evaluating the habitat loss, the restoration site and its size are primarily selected on the basis of availability and cost. The restoration site may be adequately designed and planned by wetland scientists, but the central question of whether there is any net loss of wetland acreage and value is often not addressed.

Wetland restoration and creation has taken many forms. Table I lists the types and their advantages and disadvantages.

As Table I illustrates, there is a basic shortcoming with most restoration and creation wetland mitigation plans for coastal California: *they usually result in a net loss of wetland habitat*. Restoring degraded wetland may sound like a positive step, but along the urbanized portion of the California coast, the remaining wetland acreage is already adversely impacted.[2] When developers restore impacted wetlands, they are experimenting with acreage that is more than likely counted in our remaining viable wetland acreage. In return for this experimentation, the developer is filling an equal or smaller area of degraded wetland. In fact, this process will only serve to urther shrink our total wetland resources. To retain and expand our wetland resources and preserve the natural patterns of distribution, we have to restore those areas which are part of our historical wetland acreage but no longer provides

TABLE I
TYPES OF WETLAND RESTORATION AND CREATION
(MITIGATION FOR WETLAND FILLING)

Type	Advantage	Disadvantage
Purchase of existing funcfuntional wetland & dedicate to public agency.	Places control of wetland development in hands of agency emphasizing emphasizing resource protection.	Net loss of functional functional wetland. Sets precedent- allow loss of a large % of remaining wetlands.
Restoration of degraded wetland with some functional value.	Fair chance of success; works with existing wetland ecosystem.	Net loss of wetland.
Enhance degraded wetland by opening to tidal influence	Significantly improves habitat diversity & species abundance.	Net loss of wetland.
Creation of new wetland site adjacent to existing wetland.	Provides developer with greater flexibility for mitigating impacts.	Success rate low. Value of created wetland is not well documented.
Restoration of degraded, historic wetl. area with no functional value.	Net gain of wetland. Success higher than creation of new wetland.	Still in experimental stage mental stage. Value of wetland not well documented.

functional wetland values.
It is important, therefore, that the planner and applicant carefully evaluate the type of land slated for restoration to determine if the standard of "no net loss" will be met. Further, to provide a higher probability of attaining a suitable level of wetland values with a restored site, the restoration should be located adjacent to an existing functional wetland system. Isolated restoration sites will probably have a lower chance of attaining full wetland values, due to separation from seed sources, wetland animal populations, and tidal sources of benthic, planktonic and fish organisms.

Mitigation Ratios

When a development proposes to restore or create wetland as a mitigation for wetland fill or dredging, the permitting agency must determine if the quantity and quality of the proposed habitat restoration will replace the wetland area filled. Due to the uncertainty regarding both the success and habitat value of wetland creation projects, resource agencies have usually required additional acreage beyond that filled and/or dredged. A typical wetland replacement ratio is 4 to 1, but this ratio has varied higher and lower depending on the actual value of the filled wetland and the type of restoration proposed.

In an effort to refine the process, federal agencies have relied on scientifically based habitat evaluation methods such as HEP and WET (Adamus, 1987) to determine wetland

Using Restoration .

Wetland planners and scientists have found that mitigating wetland impacts by filling in productive wetland areas and restoring degraded areas, does not always result in ***no net loss of wetlands***. There are several factors that can contribute to this:

1) Because of the pressure of urban development, many impacted or altered wetland areas constitute the region's only remaining wetland transitional or upland areas and support important plant and animal species restricted to this habitat. Though disturbed by human activities, this impacted wetland habitat can be a significant component of our wetland system.

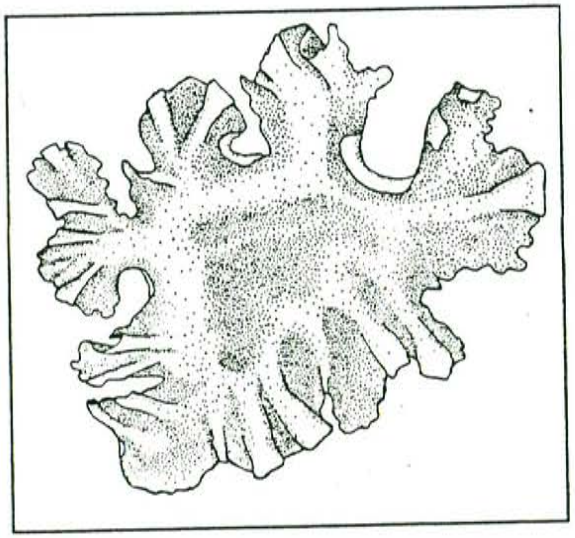
2) Determining what area of degraded wetland is equivalent in biological productivity (Sections 30607.1 and 30233) and value to the wetland area proposed for fill, does not involve a simple one-to-one comparison. The area to be filled may contain nesting area for an important wetland bird or represent an important element of the wetland food chain; an equivalent area of different habitat type may have to be considerably larger to offset this loss. It is difficult, therefore, to assure that the acreage selected and habitat provided will be equivalent to the values of the filled area.

A restoration program may involve restoration or filling a degraded wetland area which is still biologically productive. This combined with the difficulty of calculating equivalent values may result in the loss of wetland acreage.

replacement ratios. With these methods, it is possible to find that a smaller wetland restored to a higher value offset the loss of a larger acreage of degraded wetland habitat. The difficulty with HEP and WET (Adamus, 1987) is that several of the evaluation categories and criteria do not accurately reflect the ecology of California's coastal marshes.[3] In addition, the HEP used for California's coastal wetlands is a modified form which is based on biologist's opinions and can be subjective. A full HEP analysis requires species specific information on habitat requirements such as salinity levels during certain months, dissolved oxygen, or substrate composition. This information is incomplete or nonexistent for almost all of California's coastal wetland species.

The use of wetland replacement ratios is considered by many to be nothing more than guesswork, based on the principle that "more is better." To improve this "guesswork":

1) Apply the standard of "no net loss" of acreage and habitat value when developing and evaluating the adequacy of the restoration/creation plan. The underlying principal is that one cannot expect to create a smaller "supercharged" wetland habitat that offsets a larger degraded wetland area to be filled. Wetland habitat is valuable in coastal California even in a degraded condition - it is still significantly more biologically productive than the surrounding urban areas. This standard means that a planner should not accept a replacement ratio that:



a) only includes restoration of existing, degraded marsh; or

b) only includes creation of new wetland area in a location that is isolated from any existing wetland habitats; or

c) includes acreage that is not within one wetland system; or

d) includes acreage which is not of the same habitat type (WIG fn 13). For example, it is not acceptable to replace lower salt marsh habitat with an inland fresh water marsh. However, it may be acceptable to replace lower salt marsh, with a brackish water marsh habitat within the same wetland ecosystem if the regional habitat goals indicate that such habitat is regionally limited.

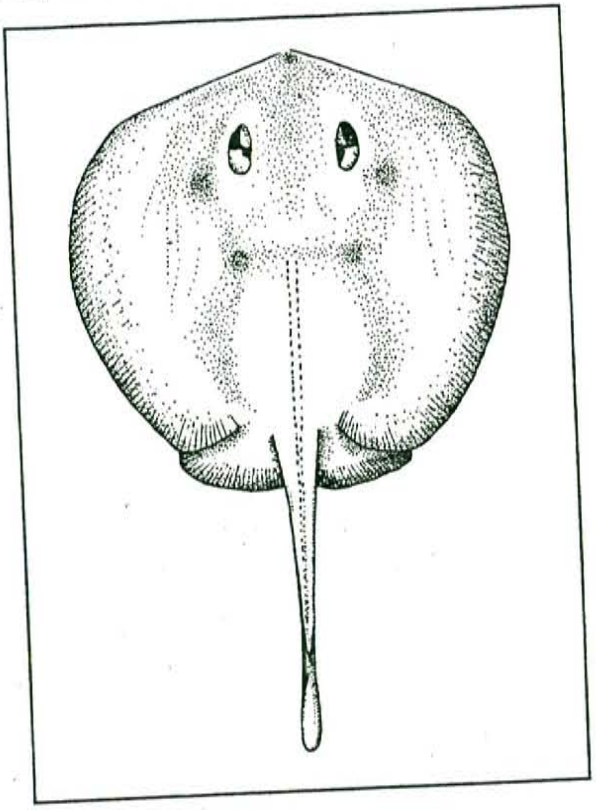
2) Encourage wetland creation projects which are conducted in conjunction with a restoration project. The location of new wetland acreage adjacent to an existing wetland area increases the probability of the success of the project.

Hypothetical Example of Acceptable Wetland Ratio -

A developer proposes to fill 10 acres of degraded but biologically functional coastal wetland within a larger wetland complex, for a coastal dependent use. It is determined that the proposed fill will not affect the functional capacity of the existing wetland complex and that there are no feasible alternative sites. An acceptable restoration plan is developed as outlined in Criteria 1.0 - 3.0, which specifies *creation* of 10 acres of intertidal marsh on completely filled and degraded historic marsh area and restoration/enhancement of an adjacent 20 acre section of the wetland by opening it to tidal circulation. The scientific evaluation of the wetland creation plan and its replacement ratio of 1:1 is acceptable because the opening of the 20 acres to tidal circulation will increase habitat diversity, bring in new species and improve the chances of successful colonization of the adjacent 10 acres of created wetland. The creation of a suitably large biological unit that will be self functioning, enables the scientific evaluation to conclude that there will be no net loss of wetland value or wetland acreage and that the functional capacity of the overall marsh is maintained.

In the above hypothetical example, it was the combination of the ten (10) acre creation and the twenty (20) acre tidal restoration/enhancement plan that made the project consistent with Coastal Act Policies. The provision of just the twenty (20) acres of tidal restoration/enhancement would not have been acceptable, because there would have been a net loss in wetland acreage. Additionally, the ten (10) acre wetland creation would not have been consistent with Coastal Act wetland policies, since there is no guarantee that a newly created wetland area could provide for the same level of wetland productivity and habitat values present in the existing wetland.

The importance of the tidal enhancement was that it improved the chance of successful restoration in the ten (10) acres of created wetland by providing a ready source of wetland species for colonization and created a combined wetland unit large enough to function as a self-sustaining ecosystem. To verify the predictions of the scientists in this case, a well-designed monitoring program must be developed and implemented. Only with adequate monitoring can the success of wetland restoration projects be assured and improved.



Criteria For Restoration Plans

Restoration Effectiveness

During the past five years the effectiveness of wetland restoration in California has been subject to considerable criticism from researchers, developers, and public agencies.[4] Restoration projects have been troubled by a poor rate of completion and failure to replace lost wetland values.

In a 1985 analysis of 58 wetland restoration permits in the Bay area, Eliot (1985) found that very few of the restored sites resembled the existing marshes in the Bay area. Additionally, of the 32 restorations that should have been completed, only 56% had been completed with 44% not initiated. A similar degree of poor restoration performance has been identified elsewhere in the nation, such as at Norfolk, Virginia[5], where only 50% of the restoration projects were considered successful.

In addition, few of the reports examining restoration projects were able to accurately evaluate the effectiveness of replacing the lost wetland functions and habitats[6] due to the lack of:

1) Clearly stated restoration objectives in either permit conditions or restoration plans, including identification of functions and/or habitats most in need of replacement or restoration;

2) Sufficient technical detail on the restoration design; and

3) Identification in the permit application staff report and/or restoration plan of the type and quantity of habitat to be lost; and

4) Adequate baseline data regarding the biological, physical and chemical parameters for the restoration area.

These difficulties have also plagued the Coastal Commission in its approval and monitoring of wetland restoration projects. The Commission staff must sift though hundreds of permit files in each District Office in order to establish the success of individual restoration projects. Without up-to-date feedback on the success of wetland restoration efforts along the coast, staff planners may recommend approval of restoration projects which may not be technically sound.

Designing an Effective Restoration Plan:

A restoration plan for a California wetland should not be based on the existing nationwide techniques and parameters established by programs such as the Dredged Material Research Program. Instead, a planner should first consider the inherent differences and values of Pacific Coast wetlands, as outlined in Chapter II, Background. Analysis of these differences and values indicates that due to the limited nature of California's coastal wetland habitat, its principal value is as *wildlife habitat* for five rare and endangered species, migrating waterfowl and shorebirds, and resident birds and animal species. Also important is the value of these wetlands as nurseries for marine fish, anadromous fish, and marine invertebrates.

The creation of a well designed restoration plan is a process involving the:

1) setting of regional habitat goals; and

2) documenting on-site conditions; and

3) comparing on-site findings with identified regional goals and selecting priority species for restoration design; and

4) developing the hydrological, biological, engineering and public access components of the Restoration Plan; and

5) assessing the feasibility of the components developed in step 4, (and making necessary modification and correction based on the assessment); and

6) developing the Final Restoration Plan.

Types of Restoration Plans Reviewed by Coastal Commission

A restoration plan can be submitted to the permitting agency either as a mitigation for a project which is impacting a wetland or as a restoration project not associated with any wetland development. In the latter case, the restoration plan is typically submitted by a resource agency or private entity which owns or has management control over the wetland area. This could include agencies-entities such as the U.S. Fish and Wildlife Service, California Department of Fish and Game, California Department of Parks and Recreation, Coastal Conservancy, or University of California, or private entities such as the Nature Conservancy or Audubon Society.

Since both categories of restoration plans will be required to go through the series of steps outlined in the Coastal Permit Review, STEP 2.0, several of the information elements identified in the restoration process above (#2 and 3) will already be available. STEP 2.0 requires a development to first demonstrate whether alternative locations are available and feasible which have a lesser degree of impact than the proposed project. There are basically two categories of alternatives: offsite and onsite. Before either type of alternatives can be considered, it must be demonstrated that the filling of the existing wetland by the project (this would not be applicable in a project proposing only restoration) *would not affect the functional capacity of the existing wetland.* Once the functional capacity determination is made, then the impacts of the alternative project must be addressed.

Onsite Alternative Impacts: This alternative includes projects that are either of reduced scale or with no modification in size and scale. They are located, in whole or in part, within the boundaries of the subject wetland and involve diking and/or dredging and/or filling of any portion of a wetland, including degraded areas, upland, transitional and buffer zones. These alternatives have direct impacts upon the wetland ecosystem and require a **Restoration Plan** as a mitigation.

Offsite Alternatives: When an offsite alternative is not located within the watershed of the existing wetland or adjacent to the existing wetland, potential habitat impacts from the

Regional Habitat Goals -

If a restoration plan was proposed for the northern portion of San Francisco Bay, where striped bass are more abundant, it would include channel designs that provide striped bass habitat. In many portions of southern California the destruction of wetlands has limited the frequency of resting and feeding areas for migrating waterfowl; therefore, wetland restoration in a regional area with frequent migratory waterfowl sites, should include suitable habitat. However, without investigating regional habitat needs and developing regional habitat goals, it may not be obvious to the preparer of the restoration plan that particular types of habitat are more appropriate than others within a region.

restoration site to the existing wetland are eliminated. If the offsite alternative is within the existing wetland watershed, impacts to the existing wetland may be significantly minimized.

Therefore, alternative sites outside of a wetland's watershed require minimal environmental analysis. For alternative's located within the watershed, an analysis of sedimentation and water quality impacts to the wetland with recommended mitigations should be developed. The latter analysis should demonstrate that the proposed alternative and its mitigation plan will result in the maintenance of the existing wetland's values and functional capacity. The restoration plans for these alternative sites will require less environmental analysis those required for an onsite alternative.

Criteria 1.0 - Informational Content of Restoration Plan

The following list of criteria are intended to assist the planner and applicant in understanding what should be included in a Restoration Plan, and how it should be prepared (Criteria 2.0):

STEP 2.0 of the procedural manual requires an ecological assessment of the Restoration Plan to determine if it will maintain the wetland's values and **functional capacity**. This study should ensure that the Plan addresses those critical issues identified at the beginning of this Chapter. An acceptable restoration plan will include:

1) Clearly stated restoration objectives that are consistent with regional habitat goals. These goals shall include identification of functions and/or habitats most in need of replacement or restoration and must be as specific as possible (e.g. nesting habitats for seven pairs of clapper rails; density and growth rate of cordgrass the equivalent to that found in natural areas within a a period of five (5) years.

2) Adequate baseline data regarding the biological, physical and chemical parameters for the restoration area, including identification of the type and quantity of habitat to be lost;

3) Sufficient documentation by a qualified biologist and hydrologist, that the project will continue to function as a viable restored

Qualifications of Restoration Plan Preparers -

It is important that a Restoration Plan be prepared by a coordinated team of qualified professionals in the fields of wetland ecology, coastal geohydrology, coastal engineering and resource planning. Wetland ecologist(s) should be familiar with the overall biology of California coastal wetlands, experienced in preparing restoration plans, and recognized in the scientific community for scientific excellence. Other team biologists should include an ornithologist, botanist, small mammals biologist and marine invertebrate biologist, all of whom should be familiar with wetland systems. The coastal geohydrologist is essential to a successful restoration design, and will develop channel, basin and water control structure configurations necessary to the proper ecological functioning of the wetland plan. The geohydrologist should have extensive experience in the design of California coastal wetland restoration projects. The engineer must be familiar with the preparation of grading plans, water control structures and channel designs for wetland systems. The coastal planner should have extensive experience with resource planning in sensitive ecosystems, including knowledge of the Coastal Commission, Army Corps of Engineers, U.S. Fish and Wildlife and State Fish and Game policies and permitting procedures.

wetland site over the long term without negative impacts from sedimentation and water pollution resulting in the premature demise of the wetland. The plan should also include a discussion and numeric estimate of the chances of success for the proposed restoration;

4) Sufficient technical detail on the restoration design including: an engineered grading plan and engineered water control structures, if any; methods of conserving or stockpiling topsoil; a planting program including removal of exotic species, listing of all species to be planted, sources of seed and/or plants, timing of planting, their location and elevation on the restoration base map, and planting and establishment techniques;

5) A mechanism which allows for adjustments to be made to the restoration site when it is determined through monitoring that either compliance is lacking or the restoration techniques are not working; and

6) An implementation plan which demonstrates that there is sufficient scientific expertise, supervisory capability, and financial resources to carry out the proposed restoration and/or creation activities; and

7) A Monitoring Plan. See Criteria 3.0 for more detail.

Criteria 2.0 - General Design Standards For Restoration Plans

The design of restoration plans is a complex process, requiring the expertise of scientists and planners. Two excellent manuals on wetland restoration should

be consulted during the preparation of a restoration plan. These are "Salt Marsh Restoration" by Joy B. Zedler, which is a 1984 Sea Grant Publication (No. T-CSGCP-009), and "Marsh Restoration in San Francisco Bay - A Guide" by Michael Josselyn, which is a 1984 Tiburon Center for Environmental Studies publication (Tech. Report #3). The following list of design criteria and standards (summarized from these two documents) should be used as a guide in developing a restoration plan.

1) ***Use Existing Wetland Resources.*** If a degraded wetland site has existing wetland values, then the Restoration Plan should strive to maintain those values with the least degree of habitat modification. Incorporating an existing wetland ecosystem, no matter how disturbed, provides a restoration project with a greater chance of success than new "creation" projects. This is because even impacted wetland ecosystems serve as a source of seeds, small mammals, birds, insects and possibly benthic organisms, that can readily expand into and colonize the restored wetland habitat.[7] Newly created wetland areas are without such a source of wetland species and therefore have difficulty in attaining the level of diversity of a self sustaining wetland ecosystem.

2) ***Maximize Wetland Size.*** Strive to maximize the restored wetland size by:

   a) locating restored areas adjacent to or connected with existing functional wetland areas; and

   b) linking separated wetland areas together by consolidating scattered habitats. This linkage improves animal movement within the wetland and typically increases the biological diversity of the restored wetland. It is known from the study of isolated habitats, such as islands, that larger consolidated habitat areas tend to sustain a larger number of species[8]. However, this standard should not be interpreted as a justification to consolidate our remaining wetland acreage into "wetland reservations," which would result in a significant loss of wetland diversity and decrease in their coastal distribution.

3) ***Link High Value Habitat Areas.*** When there are two or more habitat areas of high value within a marsh ecosystem, a restoration plan should link these two areas together with a corridor instead of isolating them by development.

4) ***Limit Urban Contact.*** Minimize boundaries shared with development which will disturb wetland wildlife.

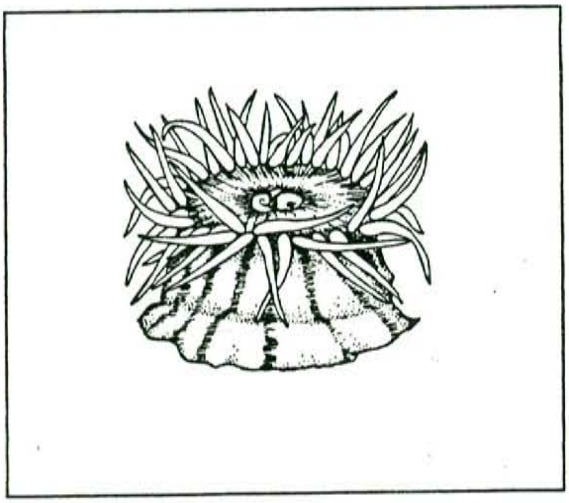
5) ***Establish Buffer Areas.*** Provide adequate buffer areas designed to minimize negative impacts from adjacent development. These include biological, physical (e.g., sedimentation, chemical pollution), noise, and visual impacts.

   Buffers are essential features to wetlands. They should (WIG's Section VII):

Sensitivity of Wetland Species to Disturbance

Species differ in their tolerance of noise and proximity of humans. Presently, more research is needed to determine the buffer requirements for birds using wetlands.[9] For example, the Clapper Rail is extremely sensitive to the presence of humans and requires adequate visual and noise buffering. Each restoration plan has to assess the buffering needs of the priority species and the degree of adjacent existing disturbances in order to design an effective buffer. Natural landforms can also be taken into consideration during the buffer design. For example, a restored wetland may serve as habitat for bird species sensitive to human intrusion, where bluffs surrounding the wetland may act as an effective visual and noise barrier allowing a narrower buffer design.

a) be a minimum of 100 feet in width. Larger buffers would be more protective, and should be seriously considered. With some species, especially those nesting near the edge of a wetland, a larger buffer is a requirement. The restoration plan must document with scientific studies that the narrower width will not have a negative impact upon marsh species in terms of disturbance of birds and small mammals (i.e. nesting, feeding, breeding, resting), and physical impacts such as erosion, sedimentation and water quality impacts from pollution sources; and



b) minimize disturbance from adjoining urban uses upon wetland animals. If the adjacent development includes residential uses, the buffer must include fencing to control the entry of dogs, cats and humans into the wetlands. Without fencing, marauding dogs and cats can decimate wetland bird species. The buffer should also provide for visual screening in those cases where wetland species are particularly sensitive to human intrusion. Where excessive noise is a problem, use of walls and berms should be considered; and

c) minimize erosion, sedimentation and pollution impacts from urban, agricultural and industrial sources; and

d) maintain an unobstructed flight path for wetland birds;

e) provide habitat for wetland transitional species, and selected wetland species such as salt marsh birds beak (Cordylanthus maritimus ssp. maritimus). The buffer and restoration design

should consider the contribution of decaying vegetation from the buffer to the detritus based food chain of the wetland. Additionally, the use of the buffer by birds to escape predation, to rest or escape high tides or to feed on transitional species must be addressed;

f) allow for passive recreational uses within the buffer zone only if it can be demonstrated that these uses will not result in negative impacts to the wetland habitat and will not affect the buffer's function as set forth in criteria "a through e." These uses should be limited to bird watching, walking, jogging and bike riding and may include the construction of paths and interpretive signs and displays. All paths should be constructed to minimize impacts to vegetation; and

> A buffer can both be a shield that minimizes disturbance to wetland species and provide an essential zone of biological transition from the wetland to urban uses.

g) provisions such as fencing to restrict off-road vehicles from buffer and wetland areas should be included. Due to the sensitivity of marsh vegetation to elevation changes of as little as four inches (4"), a single pass by an off-road vehicle can cause damage to a wetland.[10]

6) ***Provide Habitat Permanence*** - Provide for habitats that will be self sustaining and not require constant maintenance. Minimize permanent habitat failures by providing flexibility in the design. Such flexibility can allow a failed habitat to be converted to another habitat type.

7) ***Planting Plan.*** This plan should strive to salvage the marsh vegetation and topsoil removed during construction in order to use it in the restored and recreated marsh areas. Additional plant material should be drawn from local sources so that local gene pools are maintained. Wetland plants from different regions should not be introduced. Other standards to be considered by the planting plan include:

a) conducting the planting in two phases, using the first phase to establish nursery material for the second phase;

b) plant species at their elevation of greatest natural abundance and in soils with salinities no higher than those found in the natural habitat; and

c) provide protection for transplants from grazers, by using enclosures or the protection of existing canopy.

8) ***Design for Tidal Prism.*** Creation of sufficient tidal prism in the restored wetland that will provide for adequate exchange of tidal and wetland waters. If the quantity of upstream sediment introduced to the wetland will exceed the sediment flushed tidally, then

sediment basins and dredging programs to control the sediment shall be included. Such basins should be located outside of the wetland at its upper end. Dredging programs should not allow temporary disposal of any dredge spoils within the wetland or any adjacent location that would allow for its erosion into the wetland.

Tidal Flushing

The daily rise and fall of the tides creates a wide range of salinities and degrees of submergence for wetland soils throughout the marsh. It is important, therefore, to gently slope intertidal areas in marsh restoration to expose a greater quantity of habitat area.[11,12] When a wetland area is opened to tidal flushing, habitats are exposed to colonization. The tides also bring in and disperse within the wetland restoration project area, the seeds of marsh plants, spores and colonies of algae, larvae and eggs of fish and invertebrates.

The plan should also encourage the use of upstream sediment controls. This includes prohibition of grading during the rainy season, stabilization of slopes prior to the rainy season, protection of native vegetation on steep slopes and along stream corridors.

9) ***Maximize Intertidal Habitat.*** Dredged or newly constructed intertidal habitat should be created with a slope of 1 to 2% towards intertidal channels in order to reduce ponding and maximize habitat area. Additionally, newly created wetland areas should be protected from the direct force of tidal currents and wave force.

10) ***Construction Timing.*** In order to minimize disturbances to fish and wildlife resources, filling, diking and dredging activities should be conducted outside of their reproductive periods. Typically, late summer is the least disruptive.

Criteria 3.0 - Standards For Monitoring Plans

A commonly overlooked component of a restoration project is the actual implementation of the monitoring program. Developers are typically interested in meeting the requirements of the permit and may view monitoring as an unnecessary cost. Reviewing agencies generally require a monitoring plan, but little guidance or specificity is provided. Further, agency staff are often preoccupied with the continuing permit review process and unable to verify if a restoration plan is being successfully implemented and monitored. Monitoring programs, however, are an important element of the wetland restoration process. If properly conducted, monitoring provides wetland planners and managers with invaluable feedback on:

1) compliance of the restoration plan with the stated restoration goals;

2) provision of habitat values which are equivalent to the wetland values lost;

Experimental Nature of Restoration -

The science of wetland restoration is very new. Despite the limited knowledge on restoration, a flowering of consulting firms dealing specifically in the art of restoration, has occurred during the past five years. It is essential that a planner bear in mind that wetland restoration is still in the experimental stages; it has not become a conventional construction activity, where standard components can be easily assembled following set practices. Wetland scientists must be heavily involved at every stage of the restoration and monitoring process to ensure the appropriateness of design and the validity of monitoring results.

3) major problems in the restoration program which can be corrected with revised planting, and watering or buffering measures; and

4) ways in which the restoration plan design and its techniques can be modified to improve success. (This type of information will aid in the planning and design of other restoration efforts).

Without data on the four areas listed above, there is no way to evaluate the success of wetland restoration, which in turn hinders the overall progress of the science of wetland restoration. Given the limited extent of wetland resources, it is critical that restoration programs are properly designed. Otherwise, the wetland restoration alternative simply allows development to occur at the expense of coastal wetlands.

Due to the complexity of wetlands it is not possible to monitor every biological component. Such a task would be time consuming and expensive. A reasonable alternative is to monitor wetland features which ecologists have found to be important indicators of the functioning of the marsh. Table II lists the primary wetland components which should be monitored, including the technique and frequency of monitoring. It should be noted, however, that Table II represents a minimal monitoring program. Furthermore, since the science of monitoring is constantly changing and improving, certain techniques become outmoded and replaced with more effective techniques. Therefore, a planner should review a wetland monitoring program in conjunction with wetland experts in order to incorporate the latest monitoring design features and techniques.

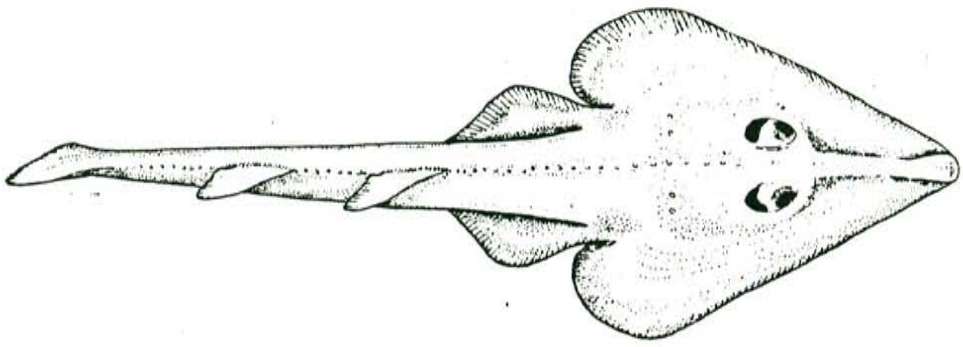
The annual aerial photograph with ground truthing called for in Table III can serve as the most direct and simplest means of determining the progress of vegetation establishment in a wetland restoration project. Other areas of sampling to be considered include toxic compounds and soil salinity. The measurement of plant growth or primary productivity and animal productivity, however, should not be undertaken in newly created marshes due to the destructive nature of the sampling.

TABLE II

RECOMMENDED MINIMUM MONITORING PROGRAM

Monitoring Objective	Technique	Frequency	Time Person Days
Vege.Establish.	Aerial Photo & Mapping	Annually late Fall or early Spring	10-20
Vege. Growth	Max-Min Biomass Evalua. at 10-12 locations	Twice Yearly	10-20
Fish Habitat	Trawl or minnow trap in marsh channels in summer: identify to species; estimate abundances and measure sizes for growth rates	June-Aug	3-6
Bird Habitat	Surveys during a full tidal cycle. I.D. Nesting sites	Seasonal: Spring & Fall to correspond to migrations	10-15
Endangered Species	Special trapping or techniques to monitor species	Annually	5-10
Maintenance of tidal flushing	Channel sediment. markers & tidal gauge observation.	Twice yearly after baseline measurements	10-15

Source: Michael Josselyn, Marsh Guide



[1] This definition is identical to the definition contained in the National Environmental Protection Act.

[2] According to Shisler and Charette approximately 90% of our urban wetlands have been altered and are in a degraded condition. Shisler, J.K. & Charette, D. *Where and what is coastal mitigation?* Jon A. Kusler Ed. In Proceedings of the National Wetland Symposium: Mitigation of Impacts and Losses. New Orleans, Louisiana, October 8-10, 1986.

[3] Onuf C.P. & M.L. Quammen. *Coastal and riparian wetlands of the pacific region; the state of knowledge about food chain support.* In: Pacific regional wetland functions: National Wetland Technical Council workshop, April 14-16, 1985. Unpublished.

[4] Race, M. 1985. *Critique of present wetlands mitigation policies in the United States based on an analysis of past restoration projects in San Francisco Bay.* Environmental Management 9:71-82

Eliot W. 1985. *Implementing mitigation policies in San Francisco Bay: a critique.* State Coastal Conservancy, Oakland, California.

Harvey, H.T. and M.N. Josselyn. 1986. *Wetland mitigation policy in California: a reply.* Environmental Management 10: 567-569.

[5] Maguire, C.E. 1985. *Wetland replacement evaluation.* Contract No. DACW-65-85-D-0068, U.S. Army Corps of Engineers, Norfolk District, Virginia.

[6] Quammen, M.L. *Measuring the success of wetlands mitigation.* Kusler (ed). In: Proceedings of the National Wetland Symposium: Mitigation of Impacts and Losses. October 8-10, 1986.

[7] MacArthur, R.H. & E. O. Wilson. 1967. *The theory of island biogeography.* Princeton Univ. press, Princeton, N.J.

[8] MacArthur, R.H & E.O. Wilson supra. note 7.

[9] Zedler, J.B. *The ecology of southern California coastal salt marshes: a community profile.* U.S. Fish and Wildlife Report OBS-81/54, March 1982. See also WIG's Section VII (B) (2).

[10] Zedler, J.B. supra note 9

[11] Zedler, J. B. supra note 9

[12] It should be noted, however, that coastal lagoons fed by rivers or streams with anadromous fishes provide important rearing habitat which can be impacted by premature and repeated exposure to tidal influence.

APPENDIX A
FORM LETTERS

FORM LETTER A

Coastal Development Permit Application Cover letter for proposed projects located within or adjacent to wetland areas.

Dear Applicant:

The California coastal wetlands and estuaries comprise the most productive biological ecosystems in California. Wetland systems function as an integral part of the Pacific flyway for waterfowl; nursery habitat for numerous benthic organisms, as well as nursery habitat for anadromous fish; feeding grounds for shorebirds, fish, shellfish, and marine mammals, and provide an opportunity for people to observe wildlife dependent on the wetland system.

Because of the biological and aesthetic importance of the wetland systems found in California, it is both from a public and biological standpoint to protect the wetland which remain. What may be considered a relatively minor development in other land areas can result in long term damage to the sensitive ecosystem of a wetland.

Due to their high level of environmental sensitivity, an ecological impact study, prepared by a qualified wetland ecologist, must be prepared for all development within or adjacent to wetlands. This analysis must address all of the applicable issues and provide all of the information outlined in the attached checklist.

The purpose of this analysis is to determine if the project proposed will maintain the biological productivity and functional capacity of the subject wetland and whether there will be a net loss in wetland acreage.

It should be noted by the applicant that most wetland projects also require review and permits (e.g.; Section 404 permit) from other state and federal agencies. Please contact the following agencies for their requirements:

State agencies:

State Lands Commission
State Dept. of Fish and Game.

Federal agencies:

U.S. Army Corps of Engineers
Environmental Protection Agency
U.S. Fish and Wildlife Service.

If you have any further questions regarding the Commission's requirements, please do not hesitate to contact me or at the above address and phone number.

Sincerely,

Coastal Program Analyst

The ecological study must be prepared by qualified ecologist(s) and/or wetland biologist(s) with experience and knowledge in wetland biology/ecology and restoration. It should contain the following informational items (Administrative Regulations Section 13053.5; WIGs III [B][1] & [2]):

Ecological Study - Why a determination of Functional Capacity (Step 3) is made prior to identification of mitigations (Step 4).

Section 30233 (c) of the Coastal Act requires all diking, dredging and filling projects to maintain the *functional capacity* of a wetland. Therefore, mitigations cannot be used to theoretically lessen the impacts of a wetland project to a level where the *functional capacity* test is satisfied. The purpose of the *functional capacity* test is to ensure that the existing acreage of our existing coastal wetland ecosystems is maintained without subjecting them to extensive manipulation through mitigation programs, including creation of equivalent wetland areas in new locations.

1) ***Comprehensive Project Description and Summary of Type(s) of Wetland Habitat*** (See Chapter 1, Definition of Wetlands and Appendix C - Illustrations of Wetland Types).

2) ***Detailed Topographic Base Map(s)*** of the site from recent aerial photographs. The aerial photos should be one to two years old at the most; if older, the photographs must indicate that they have been updated by a field check. Because the distribution, type and frequency of wetland plants is significantly affected by small elevation changes, contours on the map should be 0.5 to 1 foot. The maps should indicate a specific datum reference, either Mean Sea Level or Mean Lower Low Water. The maps should show the applicant's property boundaries, and adjacent properties, including parcel lines of any tidelands, submerged lands or public trust lands. All parcels should be identified by their Assessor Parcel Numbers.

3) ***Inundation Map*** - For nontidal wetlands, permanent or seasonal patterns of inundation (including sources) in years of low, high, and average rainfall.
4) ***Vegetation Map*** - Extent of wetland habitat and location and names of plant species and vegetation associations, prepared by a qualified biologist(s) (see Appendix D of the WIGs).

5) ***Soil Map*** - If no soil survey is available, a soils map must be prepared by a qualified soils scientist, showing the location of soil types and their physical description (see Appendix D for criteria).

6) ***Development Map*** - The location of the proposed development. This should include, if necessary, the extent and quantity of fill and/or dredging, the type and source of fill and/or dredge spoils, grain size, tests for possible pollutants in fill/dredge material and location of any proposed spoil disposal site. The location and size of any dikes, including the same information required for

filling and/or dredging, as well as the location, size, and invert elevation of any proposed culverts or tidal gates. This information should be overlain onto a wetland habitat map.

7) ***History of Site.*** This includes:

a) Collection of older aerial photos and maps.[1] These historic aerial photos and maps should be used to establish, if possible, the previous natural state of the wetland prior to artificial modification. All stages of diking, dredging, filling and any other alteration must be documented.

b) Collection and summary of all available studies of the wetland site. This should include land use studies, environmental documents, Specific Plans, Development Plans, General Plans, Local Coastal Plans, and scientific papers. Identify existing land use policies and any approved plans for the site.

8) ***Description and Analysis of Existing Ecological Conditions*** at the project site, including the impact of existing development in the wetland watershed. This includes:

a) Discussion of wetland plants, bird and animal use, marine organisms present and their ecological value.

b) Evaluation of potential and existing impacts such as the effect of sedimentation and pollutants from residential, industrial, agricultural, greenhouse and flood control activities in the subject wetland watershed. Also to be considered are detrimental discharges from wastewater plants, industrial operations, and greenhouses.

9) ***Analysis and Discussion of Project Impacts***. Determine if the project maintains the ***Functional Capacity*** of the wetland and that there will be no net loss of wetland acreage. (See Functional Capacity Box, as follows.)

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1 The University of California Remote Sensing Library at Santa Barbara is an excellent source for locating such documents.

Functional Capacity

Functional Capacity is the ability of a wetland or estuary to be self-sustaining and to maintain natural species diversity. In order to establish that the Functional Capacity is being maintained, it must be demonstrated that:

a) That the project and its impacts will not, over the long term, alter the presently occurring plant and animal populations in the ecosystem in a manner that would impair the long-term stability of the ecosystem.

b) That the project does not harm or destroy a species or habitat that is rare or endangered.

c) That the project does not harm a species essential to the functioning of the wetland, or affect the water quality through sedimentation and or chemical/biological contaminants.

10) ***Decision Making Matrix*** - Selecting the Preferred Project. The Matrix process depicted in Figure 5 combines the review and analysis of the project and alternatives into a single process and examines the biological and economic feasibility. The developer must perform the analysis, through a series of steps starting with the off-site alternative and ending with the project. The emphasis in the process is on maintaining the functional capacity of the wetland and achieving no net loss of wetland acreage. If any of the alternatives or the project do not meet the *functional capacity* test (Test One of Figure 5) of the matrix, then they are not acceptable under the provisions of the Coastal Act.

The alternative analysis set forth in the matrix will be used by the coastal staff in STEP 2.2 of this manual. The Alternative Analysis for the Decision Making Matrix should consist of:

a) Review of feasible alternative concepts ranked in order of desirability:

   i) location at another site outside of the wetland (several potentially feasible sites should be considered);

   ii) reduction of project size, density, coverage; and

   iii) reconfiguration of project;

b) Application of the following steps to each alternative:

   i) identify the impacts of the alternative to the wetland;

   ii) determine whether the functional capacity of the wetland is maintained and that there is no net loss of wetland area - *if the functional capacity test is not satisfied for any or all of the alternative, the alternative analysis cannot proceed to step c)*; and

iii) if necessary, develop a mitigation or restoration plan to maintain the biological productivity and habitat values of the existing wetland.

c) Select the alternative with the highest priority that meets the requirements of steps 2)(a,b,c) and is feasible.

If none of the alternatives are feasible and/or do not meet the requirements of steps 2)(a,b,c) then the project is selected as the preferred projected provided the requirements of steps 2)(a,b,c) are met and it can be demonstrated that the proposed mitigations can be implemented (See Chapter 3, "Criteria for Restoration Plans).

Restoration Plan Criteria

The criteria for developing a restoration plan are set forth in Chapter 3 "Mitigations" under Criteria 1, 2, and 3. Chapter 3 also explains what constitutes acceptable mitigation of wetland impacts, why restoration sites should be located adjacent to existing wetlands and why in-lieu fees and wetland banking programs are generally unacceptable as mitigations.

11) Coordinating Alternative Analysis with the Corps of Engineers (COE) "Section 404" Alternative Review Process -

Though the COE Section 404 Alternative Review Process does not officially start until after the COE files the application (which cannot occur until after issuance of a coastal development permit from the Coastal Commission or the local jurisdictions), considerable time can be saved in the Coastal Commission and COE review period by satisfying the COE Alternative Review Process requirements during the preparation of required CEQA documents (e.g.; Environmental Impact Reports [EIRs]) or included as part of the Coastal Commission Permit Application.

If an adequate alternative analysis is included in the CEQA document, the scope of the project before could be changed before any additional time and investment on the part of the applicant has occurred.

FORM LETTER B

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

CALIFORNIA COASTAL COMMISSION
SOUTH COAST AREA
245 WEST BROADWAY, SUITE 380
LONG BEACH, CA 90802
(213) 590-5071

DATE

_____
_____
_____

RE: Application No. 5-88-___ (_____)

Dear _____:

On basis of a careful review of the information you have heretofore submitted in support of the above-identified application, I have determined that in order to give the Commission the ability it must have to evaluate the resource impacts of your proposed development it will be necessary for you to submit the following additional information:

1._____

2. Etc.

I make this request pursuant to (Government Code) Sections 65944(a) and (c) of the Permit Streamlining Act (PSA) which authorize a request under the present circumstances for, respectively, 1) information in the nature of clarification, amplification, correction, or supplementation of information required for the application, and 2) information necessary to enable the Commission to fulfill its obligations under the California Environmental Quality Act (CEQA).

I further request that you submit this information to me no later than _____, 19__.

Please be further advised that (Government Code) Section 65956(c) of the PSA expressly authorizes the Commission to deny your application on the basis of a failure on your part to furnish the information requested by this letter.

Please feel free to contact me if you have any question regarding this letter.

Sincerely,

_____
Project Analyst

8659A

APPENDIX B
CATEGORICAL EXEMPTIONS

APPENDIX C
ILLUSTRATION OF WETLAND TYPES

APPENDIX D

ADDITIONAL TECHNICAL CRITERIA FOR DEVELOPING ENVIRONMENTAL INFORMATION

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

CALIFORNIA COASTAL COMMISSION
631 HOWARD STREET, 4TH FLOOR
SAN FRANCISCO, CA 94105
(415) 543-8555
Hearing Impaired/TDD (415) 896-1825

MEMORANDUM

July 11, 1989

To: Mark Capelli, Steve Stanley, Margaret McCloud

From: John Bowers

Re: Wetland Procedures Manual

Pursuant to Mark's request, I have drafted revised versions of the "permitted use" boxes appearing on pp. 35-36 of the Manual. They are as follows:

> Permitted Use #3: According to Section VIII of the WIG's, because section 30411(b)(3) authorizes DF&G to consider "whether there are...feasible ways [other than a boating facility] to achieve restoration of the [degraded] wetland's natural values...," the Commission has the authority under section 30233(a)(3) to approve wetlands uses identified by DF&G in its analysis of restoration options regardless of whether such uses are otherwise approvable under section 30233(a). Examples of such otherwise unapprovable uses that section VIII gives are "flood control projects, visitor serving commercial, recreational facilities, and private residential, general industrial, or general commercial development." However, past Commission approval of such uses has been controversial because the only use specified by section 30233(a)(3) as permittable in a degraded wetland analyzed by DF&G under section 30411(b) is a "boating facility." This problem disappears if DF&G finds the wetland area, or some portion thereof, to be so degraded that, although it may be restorable to a biologically productive condition with or without major restoration activity, it no longer exhibits the identifying characteristics of a wetland. A case in point is DF&G's section 30411(b) analysis of Huntington Beach Wetlands dated February 4, 1983. After applying Coastal Act (section 30121) and USF&WS definitional standards, DF&G concluded (at p. 15) that "35.2 acres of former wetland which have been so severely degraded that they no longer function as wetland...." In reviewing proposals for development activity on such land, whether as part of an overall wetland restoration program or otherwise, the Commission, subject to any otherwise