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California Coastal Commission

PROCEDURAL GUIDANCE FOR THE REVIEW OF WETLAND PROJECTS IN CALIFORNIA'S COASTAL ZONE

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Preface

A Note On The Use Of This Document

The Coastal Act provides strong enforceable policies for the protection of wetlands in the coastal zone. However, the accumulation of new scientific information on wetlands and the inevitability, over time, of staff changes gave rise to the need for a consistent framework for the application of those policies by Commission staff in their preparation of proposed findings for the Commission. Based on that need, the Commission sought and obtained a federal grant to develop the document: *Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone.*

The development of this new procedural guidance document will significantly improve the quality and comprehensiveness of the Commission staff's analysis and of the recommendations upon which the Commission bases its decisions; thus enhancing the Commission's ability to protect the State's coastal wetland resources. It is important, however, to accurately characterize this document and explicitly delineate its appropriate use.

Consistent with the authority delegated to the executive director by the Commission to direct the work of staff, and consistent with the Commission's duty to examine projects, amendments, and other items for Commission action on a case-by-case basis, this procedural guidance document will provide staff with relevant background information and an analytic framework for drafting proposed findings and recommendations. Although the sources of information (e.g., scientific research results or precedential Commission actions) contained in this document can and will be referenced when developing a staff report, this procedural guidance document itself will not be cited, quoted, or relied upon as the basis for recommendations or findings contained in any staff report.

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EXECUTIVE SUMMARY

Section 309 of the federal Coastal Zone Management Act of 1990 required coastal states with certified coastal zone management programs to develop "enhancement objectives" for specific issue areas. Wetlands was one of the issue areas specified in Section 309, and subsequently the California Coastal Commission (CCC) adopted an enhancement strategy that proposed strengthening the Agency's wetlands decision-making process. This wetlands procedural guidance document is the mechanism for implementing the required program changes.

This wetlands procedural guidance document has two main purposes: 1) to provide specific updated interpretations of the enforceable California Coastal Management Program (CCMP) wetlands policies and their associated procedures for Commission staff, applicants, local governments, and/or other wetlands management authorities; and 2) to refine and supplement the wetlands ecology and management issues discussed in the Coastal Commission's *Statewide Interpretive Guidelines For Wetlands And Other Wet Environmentally Sensitive Habitat Areas,* which were adopted in 1981.

This Wetlands Procedural Guidance Document consists of four chapters and three appendices, which together meet the stated purposes. The document begins with a description of the various procedures currently available for reviewing proposed wetland development projects located in the coastal zone. Topics covered include a discussion and review of the environmental review process (CEQA/NEPA), and the CCC's coastal development permit application review process for wetland development projects. Specific strategies for effective use of these review processes are also described. A major objective of these procedures is to promote early and effective participation in the relevant review process.

Chapter two provides basic information necessary for the objective development and review of comprehensive mitigation plans for development projects affecting wetlands. Mitigation for the adverse affects of development projects in wetlands can take on a variety of forms. However, compensatory mitigation (enhancement, restoration, or creation) is the most common type of mitigation proposed in coastal development permit applications. Numerous partially successful, or failed mitigation projects attest to the fact that mitigation is not a panacea. Past experience clearly shows a great deal of effort is required by all parties to ensure successful mitigation.

Chapter three provides an up-to-date review of the agencies and processes involved in the protection and management of California's coastal wetlands. The regulations, policies, and processes guiding the management and protection of California's coastal wetlands are numerous, and complex. Although specific regulations controlling development in wetlands exist at all levels of government, there is evidence to suggest

the goal of no-net-loss of wetlands has not been achieved. The ability to protect existing wetlands is also hampered by inconsistencies among regulatory agencies and gaps in existing regulations. The lack of a single, clear, and broadly instituted definition for a wetland is a major inconsistency among regulatory agencies, which can act to compound regulatory problems. Meanwhile, certain types of wetlands, such as riparian areas and seasonal wet wetlands, do not receive equal protection at all levels of government because of differences in adopted definitions, agency imposed limitations of adopted definitions, and jurisdictional limitations. More recent activities, however, should improve the current situation. Specifically, the Wilson administration (State) and the Clinton administration (federal) released wetland policy statements in August 1993, which are designed to provide a consistent policy framework for the management and protection of wetlands. Implementation of these policy statements is underway.

Chapter four presents a review of scientific and technical information relevant to understanding priority wetland resource concerns. Three features of coastal zone wetlands are discussed: 1) ecology; although a multitude of concepts, principles, and methodologies exist to assist in understanding the ecology of wetlands, our level of knowledge is still relatively rudimentary. This is particularly true for California's wetlands, where ecosystem research lags far behind that of Atlantic or Gulf cost efforts. 2) functions and values; California's coastal wetlands have a number of important functions and values. Although knowledge of most functions and values has existed for some time, their combined importance has increased over time because of the enormous wetland losses California has endured. And 3) sources of impacts; because of the relatively high social value placed on the coastal zone, coastal wetlands have received greater protection than their inland counterparts. The alteration of wetlands in many coastal states —including California— is strictly regulated and generally prohibited. Much of the current loss of wetlands in the coastal states is attributed to either a lingering legacy of past development (e.g., agricultural, urban, and industrial development) or related to secondary or indirect effects of current projects (e.g., point- and nonpoint-source pollution, or changes in the timing and amount of fresh and saltwater inputs).

This document also contains a glossary of terms, which is designed to assist the reader in understanding specific terms and scientific jargon. All words underlined in the text are defined in the glossary.

An important element of this document is the implicit commitment to keep the information current. CCC staff will update this document as new policies are put into place and as new information becomes available. This is especially relevant in light of the recently released State and federal wetland policy statements. Implementation of the initiatives and action items in these policy statements may affect management and regulation of wetlands in the coastal zone. This document provides one way to integrate these and other future changes into the CCMP.

CHAPTER ONE

COASTAL DEVELOPMENT PERMIT REVIEW PROCESS

I. INTRODUCTION:

Throughout the existence of the California Coastal Commission (CCC) much has been learned regarding California's coastal wetland resources. Over twenty years of agency-wide experience has shown that effective regulation and protection of wetland resources involves numerous components and considerable time and resources. In 1981, the CCC adopted its *Statewide Interpretive Guidelines for Wetlands and Other Wet Environmentally Sensitive Habitat Areas* (hereafter referred to as the Statewide Interpretive Guidelines). These Statewide Interpretive Guidelines (Appendix A) were written to "integrate ecological concepts and policies found in many sections of the Coastal Act into a consistent whole, explain policies for protecting natural resources, define technical terms, and facilitate application of the policies by the State and regional Commission" (CCC, 1981). Many of the objectives for this Wetlands Procedural Guidance Document are the same as those for the Statewide Interpretive Guidelines. **The overall goal of this document, however, is to provide a consistent process for the review of proposed wetland development projects in the California coastal zone. Additionally, this document includes information not available until after 1981, thereby serving to update information contained in the Statewide Interpretive Guidelines.**

There are several ways in which the CCC is notified of potential wetland development projects in the coastal zone, including:

1) *The Environmental Review Process: The California Environmental Quality Act (CEQA) and the National Environmental Protection Act (NEPA).* Many wetland development projects will trigger the State and/or Federal environmental review process. As a regulatory agency the CCC is required to review projects within its jurisdiction.

2) *Coastal Development Permit Application.* Permit application review requires CCC staff to analyze the complete permit application and prepare a staff report including recommendations for Commission action. In addition, the CCC receives notice of all pending local coastal development permits.

3) *US Army Corps of Engineers Section 404 Permits.* The CCC reviews all Section 404 permits for activities affecting the coastal zone to ensure consistency with California's Coastal Management Program.

4) *Local Coastal Program (LCP) Certification and Amendments.* The Coastal Act directs each of the 73 cities and counties lying wholly or partly within the coastal zone to prepare an LCP. Local jurisdictions containing wetlands must include regulatory policies in their LCP's to ensure consistency with the Coastal Act. This process is especially important in southern California where many land use decisions regarding wetlands are made through the LCP certification or amendment process. (See the local government regulatory programs and agencies section in chapter three for more information on this topic.)

5) *Other Regulatory Activities.* Several regulatory processes require documentation of existing or proposed project impacts. These include biological assessments for impacts to special status species, streambed alteration agreements, and violations of the Coastal Act or other regulations.

Presently, CCC staff efforts in southern California are devoted mainly to the review of coastal development permit applications (item two above). In northern California, CCC staff efforts focus on review of Section 404 permits and LCP certification and amendments (items three and four above). However, most effective regulation of wetland development, is achieved through CCC staff devoting adequate time to follow all types of wetland development project notifications. **A major objective of these procedures is to promote early and effective participation in the review of wetland development projects.** Early and effective participation will often require CCC staff input prior to receipt of an application for a coastal development permit.

The remainder of this chapter is devoted to a description of various procedures for reviewing wetland development projects. The first section deals with the environmental review process, because it is during this process that CCC staff have the greatest opportunity to begin early and effective participation in the review of wetland development projects. The second section describes the CCC's coastal development permit review process for proposed wetland development projects. The third, fourth, and fifth sections describe topics of special importance in the review of all proposed wetland development projects: identifying and delineating wetlands, establishing buffer areas, and determining functional capacity.

II. THE ENVIRONMENTAL REVIEW PROCESS:

Early and effective participation in the environmental review process is one of the best ways to ensure consistent regulation of California's coastal wetlands. Active participation in the environmental review process provides the following benefits:

- *Increases the Depth of Analysis.* CCC staff can use the CEQA/NEPA process to request project sponsors to prepare and complete the information and studies described later in this chapter prior to application for a coastal development permit. Thus, CCC staff increase the overall time available to complete an in-depth analysis of the proposed project.

- *Better Cooperation From Applicants.* Applicants appreciate early and complete identification of wetland issues, required studies, and possible mitigation alternatives. In a survey of former applicants conducted by the CCC in 1987-88, the lack of assistance in identifying necessary wetland mitigation alternatives was noted as a major short-coming of the CCC permit process. Further, when the CCC required additional studies for processing a coastal development permit application, it was often perceived by the applicant as being too late in the overall process. The earlier applicants are notified of requirements for specific studies and mitigation measures, the more likely they are to consider such issues in detail during the overall regulatory process.

- *Reduction in Permit Application Review Time.* With adequate and early input during the environmental review process, most issues will have been identified and analyzed prior to receipt of an application for a coastal development permit. This will reduce the staff time required for application analysis and report preparation.

The environmental review process either follows guidelines of the California Environmental Quality Act (CEQA) or the National Environmental Protection Act (NEPA) depending on the lead agency, and the location and type of project. The following description is for CEQA, but the NEPA process is very similar. CEQA review involves three main steps:

1) A lead agency is identified, which is responsible for examining the project to determine if it is subject to CEQA (CEQA Guidelines, Section 15061). If the project is exempt, a notice of exemption (CEQA Guidelines, Section 15062) is prepared.

2) For non-exempt projects, the lead agency conducts an initial study to determine if the project has any potential significant impacts (CEQA Guidelines, Sections 15063 and 15065). If it is determined the project will have no significant impacts, then a negative declaration is prepared (CEQA Guidelines, Sections 15070-15075).

3) If the initial study shows the project may have a significant impact, the lead agency then prepares either a mitigated negative declaration or a notice of preparation of an environmental impact report (EIR).

Figure 1 provides an overview of the CEQA environmental review process in the form of a flow chart, while each of the three main steps are discussed further below.

A. The Lead and Responsible Agencies:

CEQA Section 21067 defines the lead agency to mean:

> *The public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment.*

The lead agency has primary responsibility for ensuring all CEQA requirements are fully met, and that agency ultimately decides whether an EIR or a negative declaration is required for the project. The lead agency is determined in one of two ways. If the project will be carried out by a public agency, then that agency is designated the lead agency (CEQA, Section 15051(a)). If a non-governmental person or entity carries out the project, then the lead agency is the public agency with the greatest responsibility for supervising or approving the project as a whole (CEQA, Section 15051(b)). Although it is rare for the CCC to act as the lead agency, there are instances when this might occur. For example, some projects proposed in the CCC's original permit jurisdiction where the CCC is the first agency to review the project under CEQA, or in the CCC's review of Local Coastal Programs. The CCC's responsibilities under CEQA are normally met through the coastal development permit process, so a full EIR is not necessarily required.

In contrast, CEQA Section 21069 defines the responsible agency to mean:

> *A pubic agency, other than the Lead Agency which has responsibility for carrying out or approving a project.*

A responsible agency is required to review and comment on the lead agency's environmental determination. Having a lead agency and one or more responsible agencies results in a check and balance system intended to provide full protection of the State's natural resources.

Figure 1

EIR PROCEDURES FLOW CHART

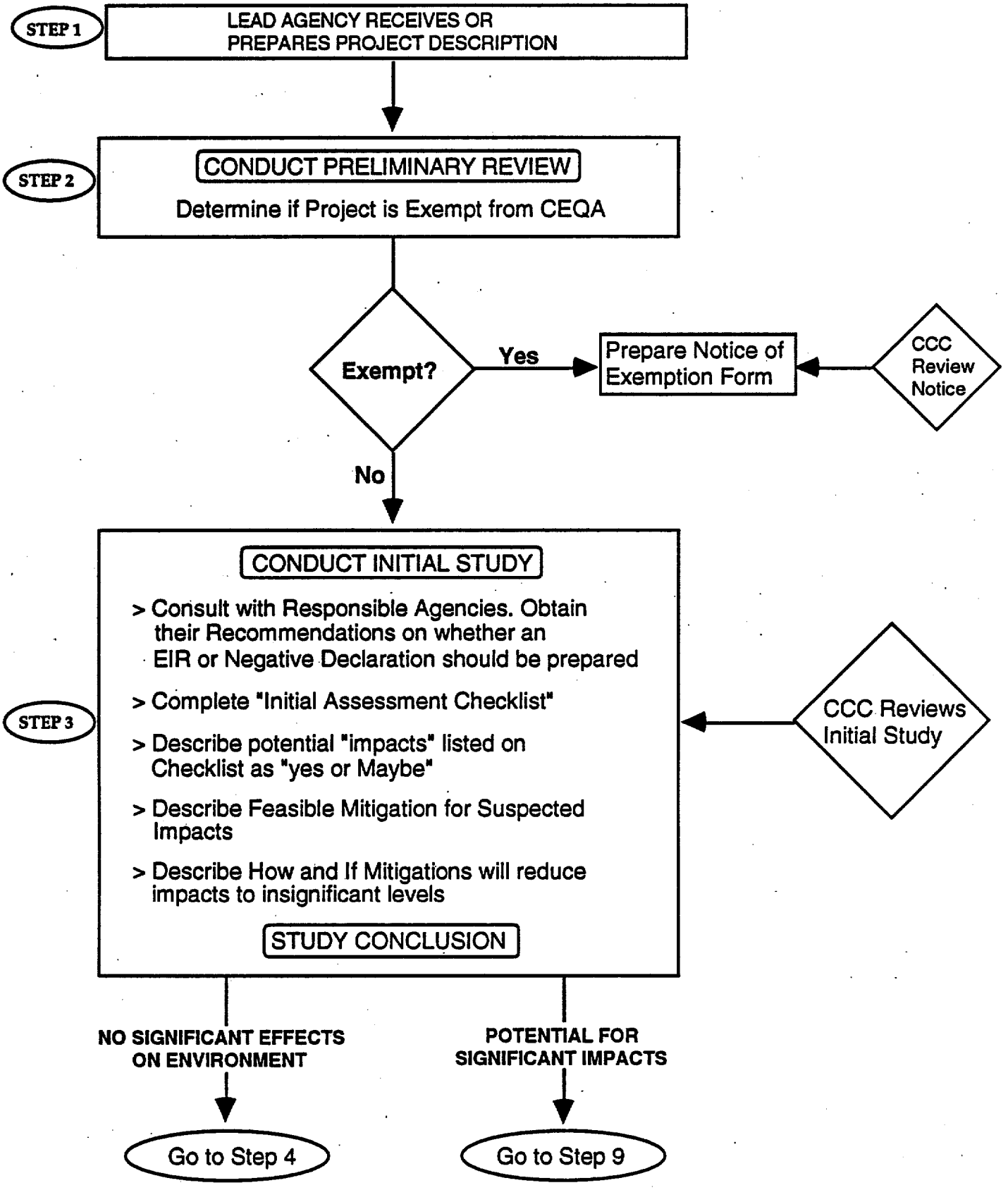


Figure 1

EIR PROCEDURES FLOW CHART (Continued)

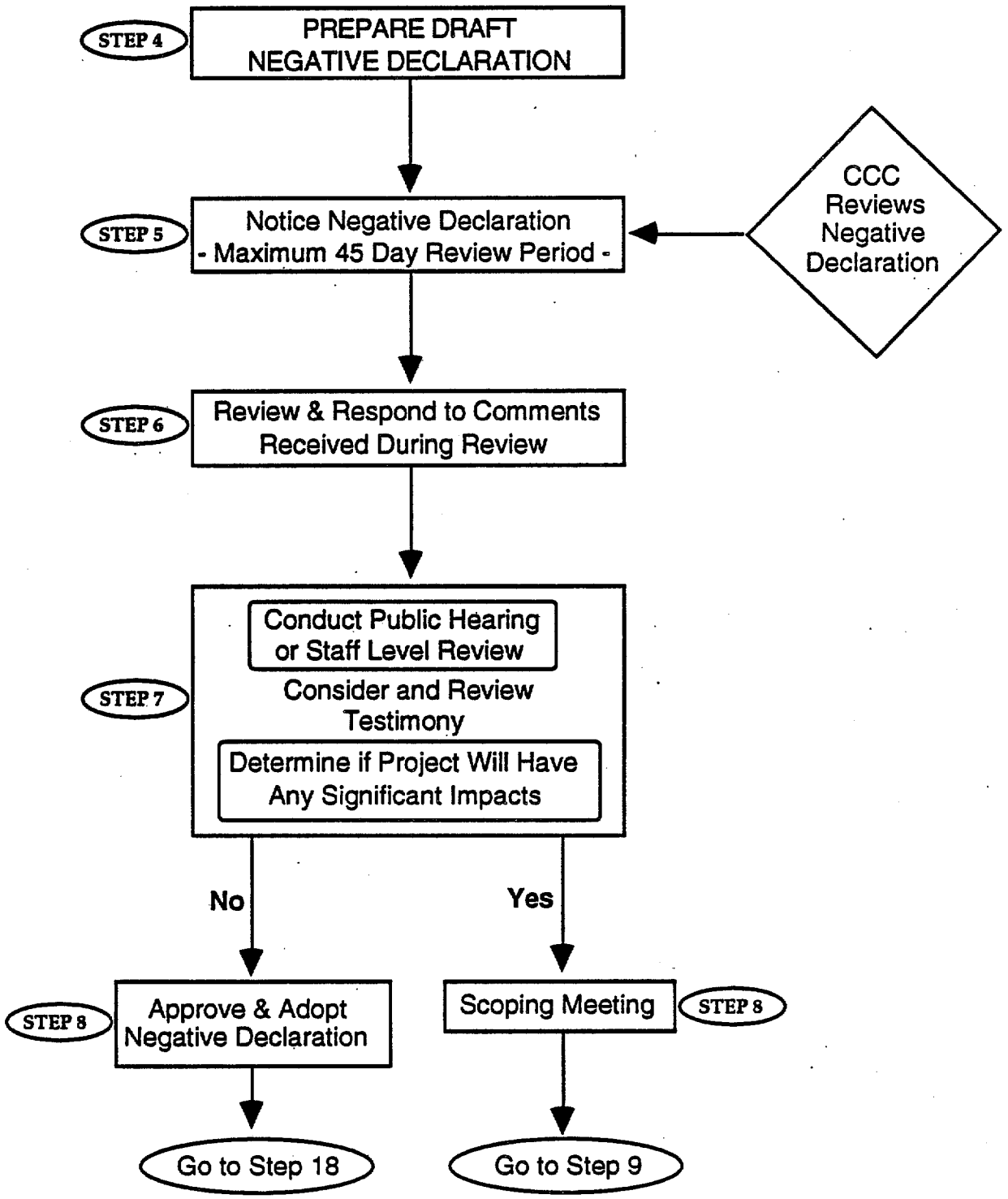
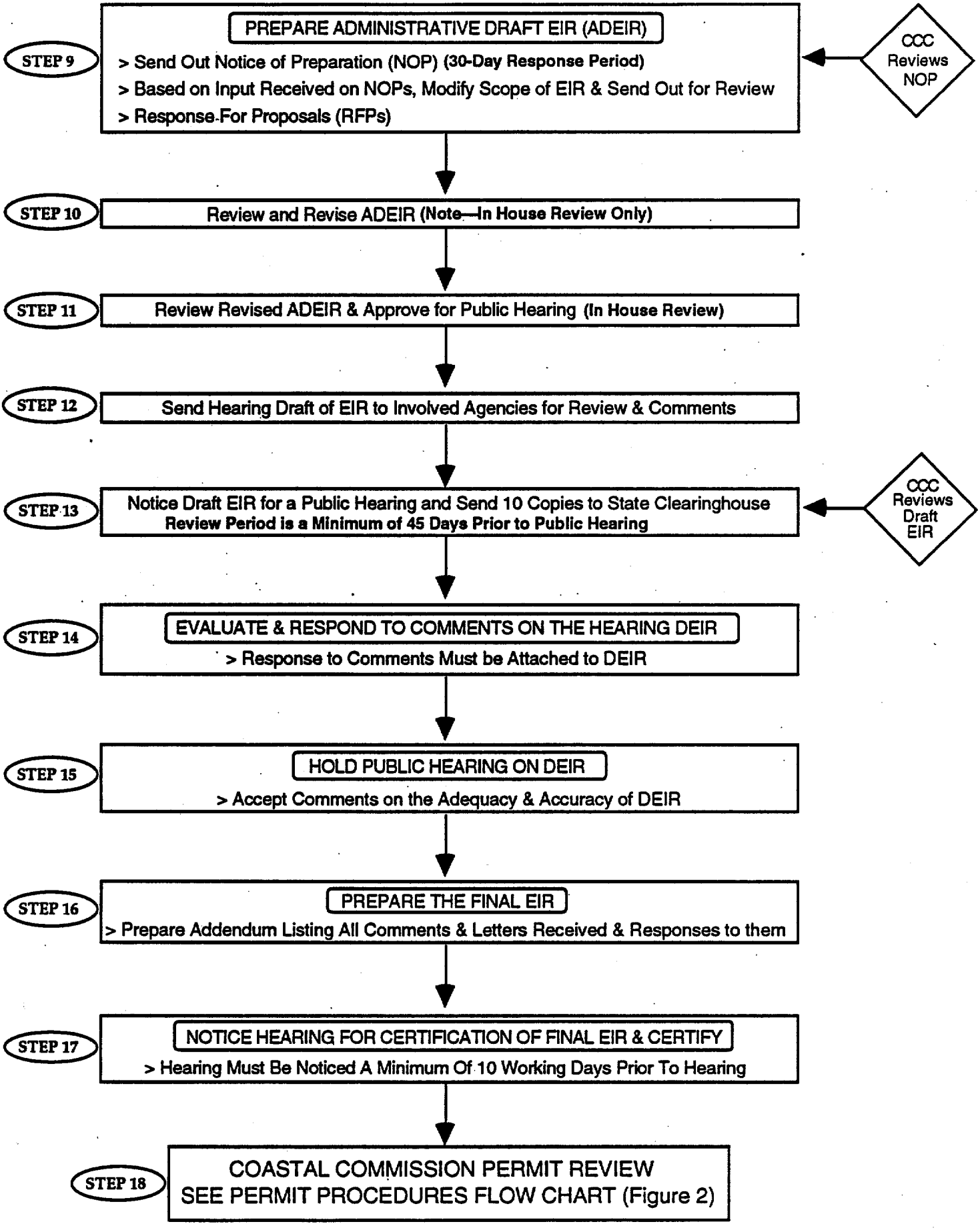


Figure 1

EIR PROCEDURES FLOW CHART (Continued)



B. The Initial Study:

The first step in obtaining approval for a development in or adjacent to a wetland is for the project sponsor to apply for a permit. Typically this permit is from a local government, special district, or in certain cases from the State or federal government. (Special districts include port, harbor, and flood control districts, as well as State colleges and universities.) Development within a wetland located in the coastal zone will also require a coastal development permit from the CCC[1].

After receiving a permit application, the lead agency conducts a preliminary review to determine if the project is categorically exempt from the CEQA process. Although some minor projects are exempt from CEQA, it is unlikely that any project affecting a wetland would be exempt under normal conditions. If the project is not exempt, then an initial study is required. The initial study consists of a checklist of potential project impacts, a qualitative assessment of the degree of impact, and an explanation for any perceived significant impacts. The completed study is then sent to all responsible agencies for review and comment.

At this early stage in the CEQA process (step 3 in Figure 1), CCC staff have the opportunity to notify the potential applicant regarding information required to process a coastal development permit application. Form letter one in Appendix A and Appendix B list information that should be requested at the time comments are submitted on the initial study.

C. The Negative Declaration:

After completion of the initial study, the lead agency prepares either a negative declaration or a notice of preparation of an EIR. A negative declaration is the lead Agency's explanation of why the project will not significantly affect the environment, and therefore, does not require preparation of an EIR. In some cases, a project that may have deleterious environmental effects can include mitigation measures, which reduce the overall environmental impact to an insignificant level. Such an interpretation requires the lead agency to issue a mitigated negative declaration.

CCC staff will have an opportunity to comment on the negative declaration or the mitigated negative declaration during the review period (step 5 in Figure 1). Like the initial study, CCC staff can use this opportunity to identify Coastal Act issues and

[1] Public Resources Code Section 13610a states: Until such time as the commission certifies a plan for an area identified as a wetland, estuary, or existing recreation area pursuant to Public Resources Code, Section 30710, any development proposed to be undertaken in such an area shall require a coastal development permit as provided in Chapter 7 of the California Coastal Act of 1976 and these regulations".

information necessary to file and analyze a permit application for a wetland development project (see Form Letter One, Appendix A and Appendix B).

D. The Environmental Impact Report:

An environmental impact report (EIR) must be prepared if the lead agency determines that the proposed activity will have a significant environmental impact, which cannot be reduced to insignificant levels through the actions of a mitigated negative declaration. As previously mentioned, this determination is made through completion of the initial study. The lead agency will publish a notice of preparation (NOP) if an EIR is required (step 9 in Figure 1). The purpose of the NOP is to elicit input on the scope of issues and the kinds of analyses the EIR should include. **Responding to the NOP provides CCC staff with the best opportunity to request all of the necessary information, data, studies, and analyses required for filing a complete coastal development permit application (see Form Letter One, Appendix B and Appendix C). It is essential for CCC staff to identify all information needs at this stage, because it is often more difficult to obtain additional information after the EIR is completed[2].**

The draft EIR is the first version of an EIR released by the lead agency for public comment (step 13 in Figure 1). Examination of the draft EIR is another opportunity for CCC staff to review and comment on proposed wetland development projects (see Form Letter Two, Appendix B and Appendix C). **However, comments for new information or analyses, or other significant changes are not as effective as when they are presented at the NOP stage. Comments on the draft EIR should focus on pointing out errors in data and analyses, and on establishing an administrative record by which the commenting party may pursue other options under CEQA. However, any information requested by CCC staff in earlier comments, should be requested again if it is not included in the EIR.**

Throughout the CEQA process CCC staff have multiple opportunities to submit comments regarding the proposed development project. Each of these opportunities (but particularly comments on the negative declaration or NOP) can serve as early notice to the applicant of the CCC's requirements for information necessary to file and evaluate a coastal development permit application.

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[2] This is particularly true in light of several changes made to the California Environmental Quality Act (CEQA) during the 1993 legislative session. The emphasis of these changes , as well as a general trend in the environmental review process, is to "front load" the review process. This could mean, for instance: 1) emphasizing master EIRs which are prepared at the land use plan stage, rather than the specific project review stage; 2) forcing or encouraging agencies to participate more fully in the initial project referral process conducted by the lead agency; or 3) other steps designed to avoid "late-hits" in the environmental review process.

III. COASTAL DEVELOPMENT PERMIT APPLICATION REVIEW:

The overall goal in reviewing a coastal development permit application is to determine if the proposed project is consistent with the Coastal Act. To ensure the review considers all appropriate sections of the Coastal Act, one of the first steps is to determine the type of project and the potential impacts. Such determinations are initially made from information provided in the permit application. In the case of a coastal development project affecting a wetland, relevant information might include: 1) A wetland delineation report; 2) identification of environmentally sensitive areas; or 3) notification that the project includes dredging, diking, or filling. However, Coastal Act Section 30121 broadly defines a wetland in the following way:

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

Thus, the applicant may be unaware that a wetland (as defined in the Coastal Act) exists in the proposed development area. To ultimately determine if a wetland exists, CCC staff may need to consult other agency staff (e.g., the Department of Fish and Game, or the U.S. Fish and Wildlife Service), other information sources (e.g., aerial photographs, or national wetland inventory maps), or personally visit the site. If it is determined that the proposed project could affect a wetland then the following procedures are applicable.

Successful and complete review of an application for a coastal development project affecting a wetland is a relatively complex process. Procedural problems facing CCC staff can include incomplete applications, missing environmental documentation, inadequate studies, uncooperative applicants, and limited staff time for internal analysis. A complete permit application for a wetlands development project will include administrative and technical information, an analysis of alternatives, and if necessary, plans for mitigation and monitoring.

In addition to the procedural requirements, review of a wetland development project application is made more difficult by the complex nature of wetlands (see chapter four). Wetlands must be viewed as a complete ecosystem that require a full complement of critical components in order to function. Some of these components are proper soil and hydrology, an unpolluted water source, and adequate buffer areas. Additionally, the wetland may contain one or more habitat types (e.g., upland, vegetated marsh, mudflat, and open water) within its boundaries. These components and habitats interact to form a complex ecosystem that supports a diverse and abundant assemblage of plants and animals, and performs numerous beneficial functions. Thus, analysis of a proposed wetland development project must examine the impacts to the entire ecosystem, not just localized site-specific impacts.

The following sections present a description of the steps necessary in the review of a coastal development permit application for a wetland development project.

A. Initial Application Review:

A coastal development permit application should not be filed until after an initial review is completed to determine the presence of all required information. In addition to the items required by Section 13053.5 of the CCC Administrative Regulations, all of the relevant information listed in the ecological study checklist (Appendix B) must be present. If, after the initial review, the application is found to be incomplete, a letter identifying the missing items should be sent to the applicant (see Form Letter Three, Appendix A).

This initial review is an integral part of the overall CCC staff analysis, since many of the application items must be examined in detail to determine if they are complete. Thus, it is important to use the time spent on the initial analysis not only to determine application completeness, but to gain an overall sense of the project and formulate initial reactions as well. This latter information may also help in clarifying or augmenting requests for additional information.

B. Staff Analysis:

A coastal development permit application is considered "filed" after CCC staff determine the application is complete. Under normal circumstances, the CCC must act on a filed application within a limited time frame. The first step in this process is for CCC staff to complete an analysis of the application for consistency with the Coastal Act. The results of this analysis are described in the form of a staff report to the Commissioners, which includes suggested findings, recommendations, and any special conditions. In analyzing a wetlands development project for consistency with the Coastal Act, CCC staff analysis should consider Sections 30230, 30231, 30233, and 30240; however, Section 30233 is the most specific policy regulating development in wetlands[3]. That section establishes three tests for CCC evaluation of a wetlands development project: 1) whether the project is one of eight allowable uses; 2) whether the project is the least environmentally damaging feasible alternative; and 3) where adverse impacts will occur, whether the project includes a feasible mitigation plan.

[3] See Chapter Three, Section III(C) for a complete citation of Coastal Act Section 30233, including a listing of the eight allowable uses.

Figure 2 contains a flow chart that shows the order in which these tests are completed and the essential parts of each test. Additionally, each of these tests is discussed below in further detail.

1) Allowable Use Analysis[4]:

The first test requires analysis of the proposed project to determine if it is consistent with one of the eight allowable uses cited in Coastal Act Section 30233. Interpretation of certain allowable uses has generated some uncertainty in the past, so further elaboration is provided here.

i. Allowable use Number One:

This allowable use includes "new or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities". Past controversy has centralized on the definition of a "coastal-dependent industrial facility". Coastal Act Section 30101 defines a coastal-dependent facility to mean:

> *any development or use which requires a site on, or adjacent to the sea to be able to function at all.*

Determining if the facility must be located on or adjacent to the sea to function is the key to deciding whether an industrial facility is coastal-dependent. Examples of this type of development may include, but are not limited to, fish processing plants, seawater desalinization plants, and kelp processing plants.

ii. Allowable Use Number Three:

This allowable use describes the conditions under which the development of boating facilities is permitted in wetlands. Much of the controversy involving this allowable use centralizes around development in degraded wetlands. Development of boating facilities in degraded wetlands is an allowable use provided that the total development does not exceed 25 percent of the degraded wetland **and** that a substantial portion (but no less than 75 percent) of the degraded area is restored and maintained as highly productive wetland.

Determining whether a wetland is degraded or not is often a central issue to application of this allowable use. A framework for determining the status of a wetland is incorporated into this allowable use by reference to the provisions under Section 30411 of Coastal Act. Specifically, through the process outlined in Coastal Act Section

[4] Not all allowable uses are discussed here. See Chapter Three, Section III(C) for a complete citation of Coastal Act Section 30233, including a listing of the eight allowable uses.

Figure 2

CCC PERMIT PROCEDURES

FLOW CHART FOR REVIEWING A WETLANDS DEVELOPMENT PROJECT APPLICATION

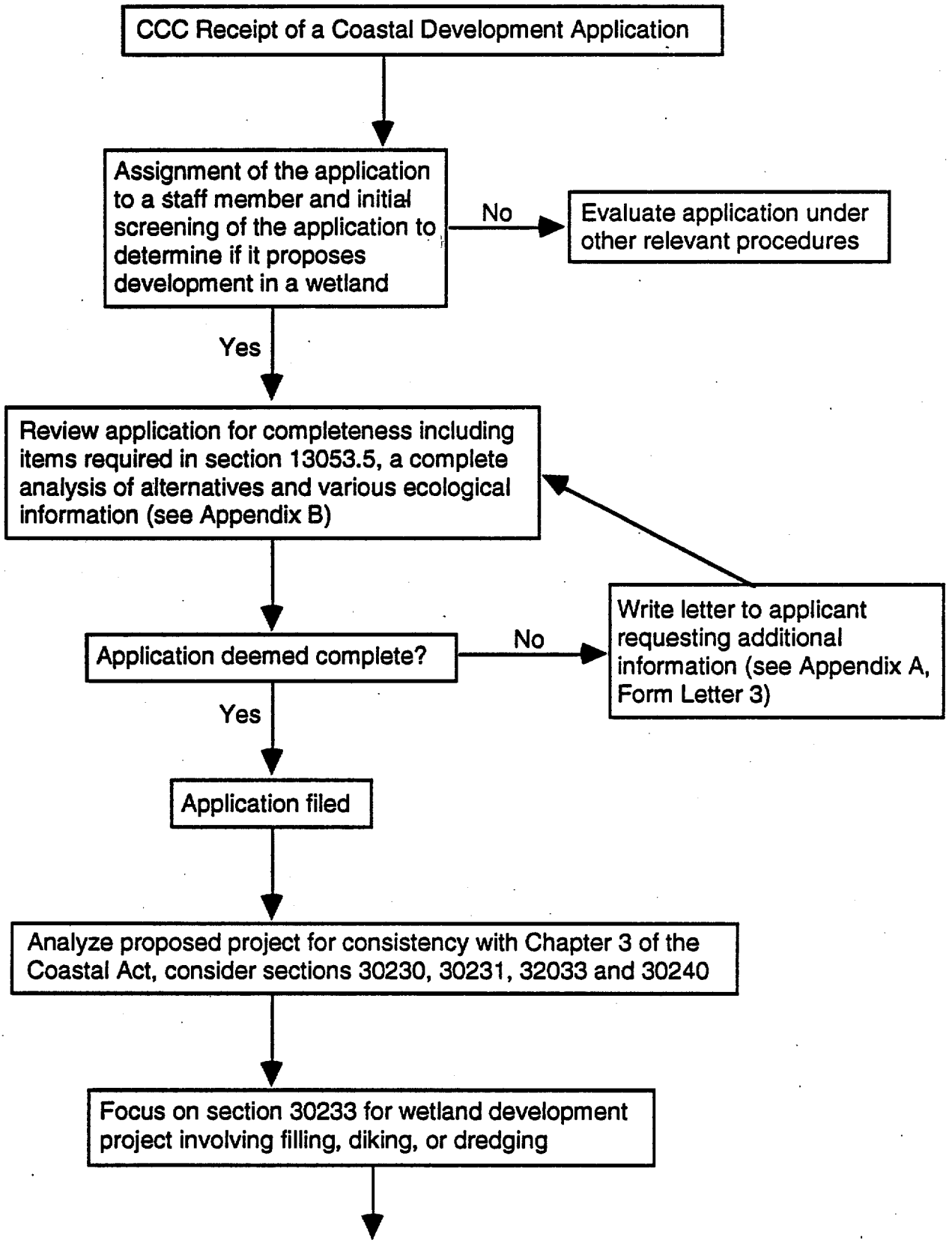

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Figure 2

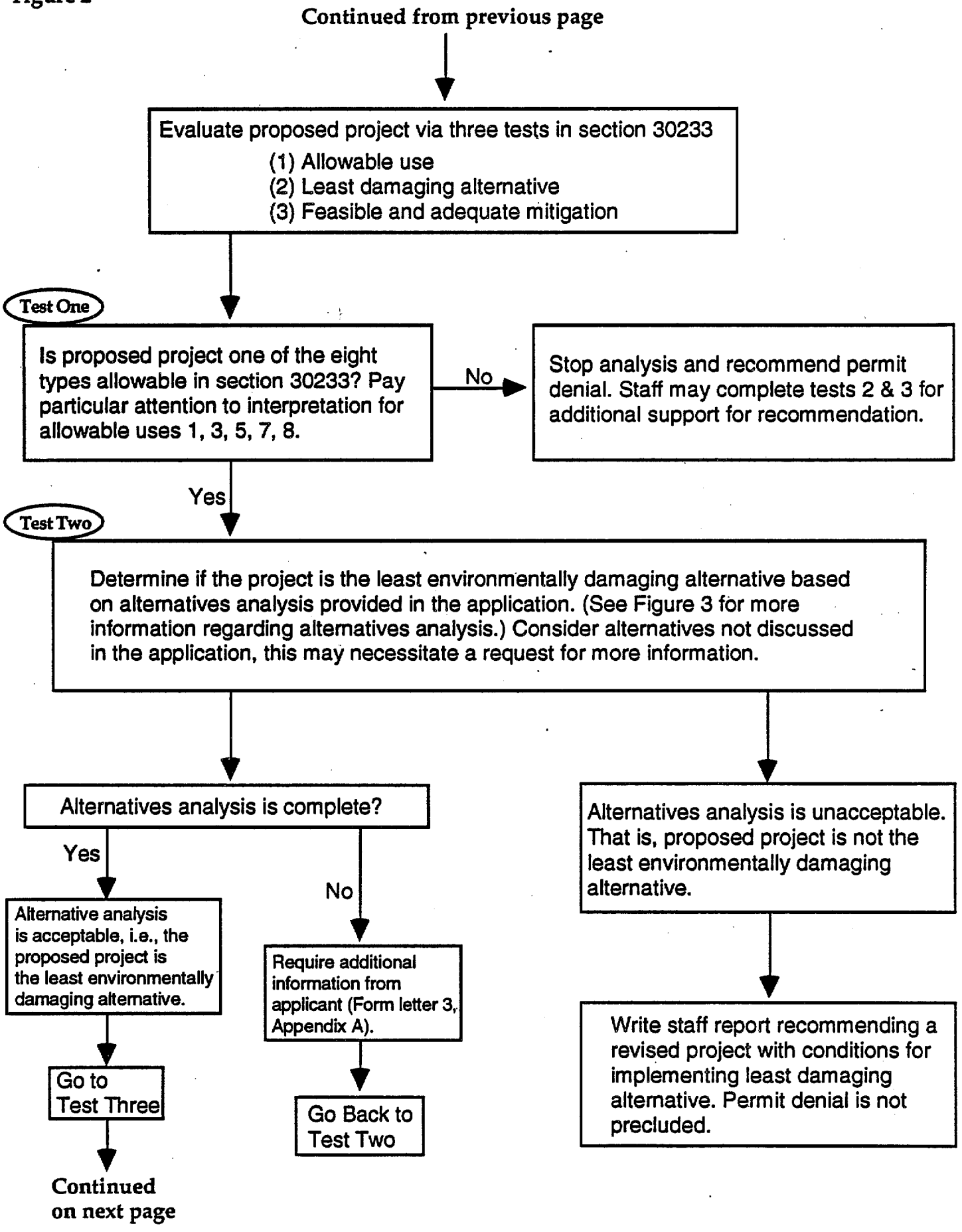
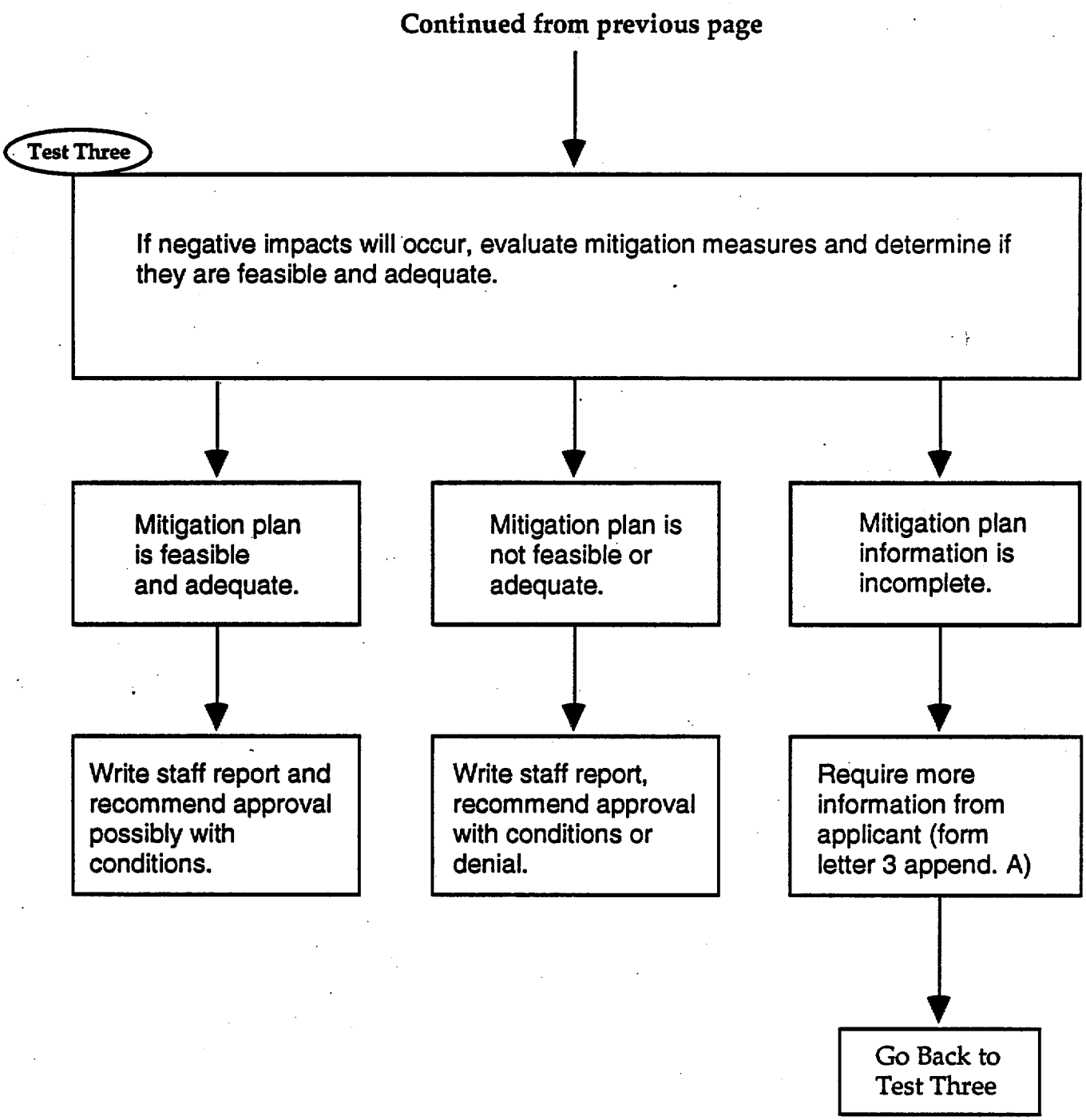

Continued from previous page
Evaluate proposed project via three tests in section 30233
(1) Allowable use
(2) Least damaging alternative
(3) Feasible and adequate mitigation
Test One
Is proposed project one of the eight types allowable in section 30233? Pay particular attention to interpretation for allowable uses 1, 3, 5, 7, 8.
No
Stop analysis and recommend permit denial. Staff may complete tests 2 & 3 for additional support for recommendation.
Yes
Test Two
Determine if the project is the least environmentally damaging alternative based on alternatives analysis provided in the application. (See Figure 3 for more information regarding alternatives analysis.) Consider alternatives not discussed in the application, this may necessitate a request for more information.
Alternatives analysis is complete?
Yes
Alternative analysis is acceptable, i.e., the proposed project is the least environmentally damaging alternative.
Go to Test Three
No
Require additional information from applicant (Form letter 3, Appendix A).
Go Back to Test Two
Alternatives analysis is unacceptable. That is, proposed project is not the least environmentally damaging alternative.
Write staff report recommending a revised project with conditions for implementing least damaging alternative. Permit denial is not precluded.
Continued on next page

Figure 2


Continued from previous page
Test Three
If negative impacts will occur, evaluate mitigation measures and determine if they are feasible and adequate.
Mitigation plan is feasible and adequate.
Mitigation plan is not feasible or adequate.
Mitigation plan information is incomplete.
Write staff report and recommend approval possibly with conditions.
Write staff report, recommend approval with conditions or denial.
Require more information from applicant (form letter 3 append. A)
Go Back to Test Three

30411(b), the Department of Fish and Game (DFG) in consultation with the CCC, and the Department of Boating and Waterways may study degraded wetlands and verify those most feasibly restored in conjunction with the development of a boating facility (see Chapter three for more information). In particular, Coastal Act Section 30411(b)(3) states that the DFG shall in the study of degraded wetlands include consideration of the following:

> *Whether restoration of the wetland's natural values, including its biological productivity and wildlife habitat features, can most feasibly be achieved and maintained in conjunction with a boating facility or whether there are other feasible ways to achieve such values.*

In determining the status of a wetland, the DFG must decide if anthropogenic activities have altered the wetland system to such an extent that what remains exists in a degraded condition when compared to other unaltered areas or historic information[5]. Such an assessment must consider the overall condition of the subject area including an investigation of the physical, chemical, and biological properties, the habitats present, and the functions. The DFG has completed several such studies in the past (e.g., DFG, 1981).

The Statewide Interpretive Guidelines provide an expanded interpretation of Section 30411[6]. This interpretation encourages development types other than boating facilities, so long as restoration of the degraded wetland is a primary objective. This interpretation has been used to support other types of projects (e.g., flood-control facilities) in degraded wetlands.

Determining a degraded wetland's boundaries is also a potential source of controversy. In general, the wetland boundaries should be based on the area the entire wetland occupied prior to degradation. This determination is most readily made from a review of historic information including aerial photographs.

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[5] In the DFG's 1981 report, *Determination Of The Status Of The Bolsa Chica Wetlands* a degraded wetland was defined as "A wetland which has been altered by man through impairment of some physical property and in which the alteration has resulted in a reduction of biological complexity in terms of species diversity of wetland-associated species which previously existed in the wetland areas."

[6] The Statewide Interpretive Guidelines, Section VIII(D) state: "Section 30411 does not explicitly identify the other types of restoration projects. However, such projects are encouraged if they promote the restoration of degraded areas and if boating facilities are not feasible. An example would include flood control projects undertaken by a public agency. Such projects may be permitted under Section 30411 if they restore channel depths, are designed to enhance the functional capacity of the wetland area, and are the least environmentally damaging alternative to achieve restoration."

iii. Allowable Use Number Five:

This allowable use relates to incidental public service purposes that **temporarily** impact the resources of an area, such as burying cables and pipes, or inspection and maintenance of existing structures such as piers and outfall lines. One potential area of controversy involving this allowable use focuses on what constitutes a temporary project and whether mitigation is required for temporary impacts to a wetland. Coastal Act Section 30607.1 provides some direction on the issue of mitigation for temporary projects and states in part:

> *The mitigation measures shall not be required for temporary or short-term fill or diking if a bond or other evidence of financial responsibility is provided to assure that restoration will be accomplished in the shortest feasible time.*

However, past decisions by the CCC have been fairly restrictive as to what constitutes a temporary project. Additionally, the CCC has in certain instances required mitigation measures for temporary impacts. Thus, CCC staff must use caution in their review of projects qualifying under this allowable use.

Another question arising under this allowable use is whether roads qualify as an incidental public service. Although the Statewide Interpretive Guidelines (CCC, 1981) states that roads do not qualify as an incidental public service, footnote three of this document states that:

> *When no other alternative exists, and when consistent with the other provisions of this section* [i.e., Coastal Act Section 30233], *limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted. Activities described in the Commission's Guidelines on Exclusions from Permit Requirements applicable to roads also should be consulted.*

As written, however, this interpretation only applies to the limited expansion of **existing** roadbeds and bridges where necessary to maintain **existing** traffic capacity.

iv. Allowable Use Number Seven:

Restoration is another use allowed under Section 30233, which has been subject to varying interpretations. In the strictest sense, projects undertaken solely for restoration purposes are beneficial, since the project should result in an increase in wetland acreage and function. Thus, in reviewing projects proposing strictly wetlands restoration, staff should focus on the net benefit or gain in wetland functions and habitat.

In contrast, Section IV(C) of the Statewide Interpretive Guidelines (CCC, 1981) makes a case for allowing "some fill for non-permitted uses if the wetlands are small, extremely

isolated and incapable of being restored", if the applicant "provides funds sufficient to accomplish an approved restoration program in the same general region[7]". The main point of this section, however, is that filling wetlands for non-permitted uses is allowed only where restoration is the main purpose of the project. Nevertheless, this approach should be used with caution. Recommending a coastal development permit for an unallowable use as part of a wetland restoration project should be avoided even if the restoration component appears adequate. Wetlands are hard to restore and even harder to create, and CCC staff are encouraged to work with what they have. To allow even partial filling of any wetland in exchange for restoration can result in a net loss of both wetland acreage and function.

v. Allowable Use Number Eight:

This allowable use permits wetland development for nature study, aquaculture, or similar resource dependent activities. Most of the discussion surrounding this allowable use is related to determining what constitutes an aquaculture activity. Coastal Act Section 30100.2 defines aquaculture to mean:

> *A form of agriculture that is devoted to the controlled growing and harvesting of fish, shellfish, and plants in the marine, brackish, and fresh water. Aquaculture products are agricultural products, and aquaculture facilities and land uses shall be treated as agricultural facilities and land uses in all planning and permit issuing decisions governed by this division.*

Although the Coastal Act interprets aquaculture and agriculture as similar activities and is generally supportive of these activities, the Act does not intend for agricultural activities to be considered an allowable use in wetlands. For example, aquaculture does not mean the culture and production of commercially utilized inland crops, including but not limited to, rice, watercress, or bean sprouts. Additionally, aquaculture activities can only be located in a wetland if they are dependent upon the resources of the wetland to function. Support facilities, such as parking lots and buildings for maintenance or processing activities are not permitted in the wetland under this allowable use.

[7] Here region is used in the ecological context to mean a proximity that results in direct benefits to the same suite and/or populations of organisms.

2) Alternatives Analysis:

An alternatives analysis is required if the proposed wetland development project is determined to qualify as one of the eight allowable uses (Coastal Act, Section 30233). Completion of an alternatives analysis is extremely valuable, as it requires the analyst and the applicant to view the project from a different perspective, which can result in the synthesis of creative designs that significantly reduce or minimize project impacts.

If the alternatives analysis cannot yield a definitive finding because of insufficient information, the applicant should be contacted for additional information (see Form Letter Four, appendix A), which if not provided will result in a recommendation for denial of the project. This situation is avoided by carefully reviewing the permit application before filing, in order to determine the adequacy and completeness of the alternatives analysis.

Section 30233 allows for the filling, dredging, or diking of wetlands, provided the project is an allowable use and that there are no less environmentally damaging feasible[8] alternatives. The alternatives analysis framework presented here is based on Section 30233 of the Coastal Act and CEQA[9] (Public Resources Code Section 21000 et. seq.). In addition to the discussion below, an alternatives analysis flow chart is presented in Figure 3.

In an alternatives analysis CCC staff examine the primary alternative (i.e., the proposed project), and compare it to other possible alternatives to determine which is the least environmentally damaging feasible alternative. All alternatives are proposed by the applicant. Each alternative is analyzed under two resource impact criteria: 1) loss of wetland acreage; and 2) loss of wetland functional capacity. The most straightforward way to complete this analysis is to determine the level of impact for each criterion separately and then compare the results among alternatives. The alternative with the lowest overall resource impacts is deemed the least environmentally damaging feasible alternative. Unfortunately, most alternative analyses are not this straightforward and require comparisons between criteria as well as alternatives. Additionally, while evaluating the loss of wetland acreage is a relatively straightforward process, evaluating the loss of functional capacity is often complex (see determining functional capacity section below). Moreover, the weight given each criterion is not necessarily fixed or equal: in some cases it may be determined that preservation of wetland acreage is more important than preservation of functional capacity, although in other cases it may be determined that preservation of functional capacity is more important than

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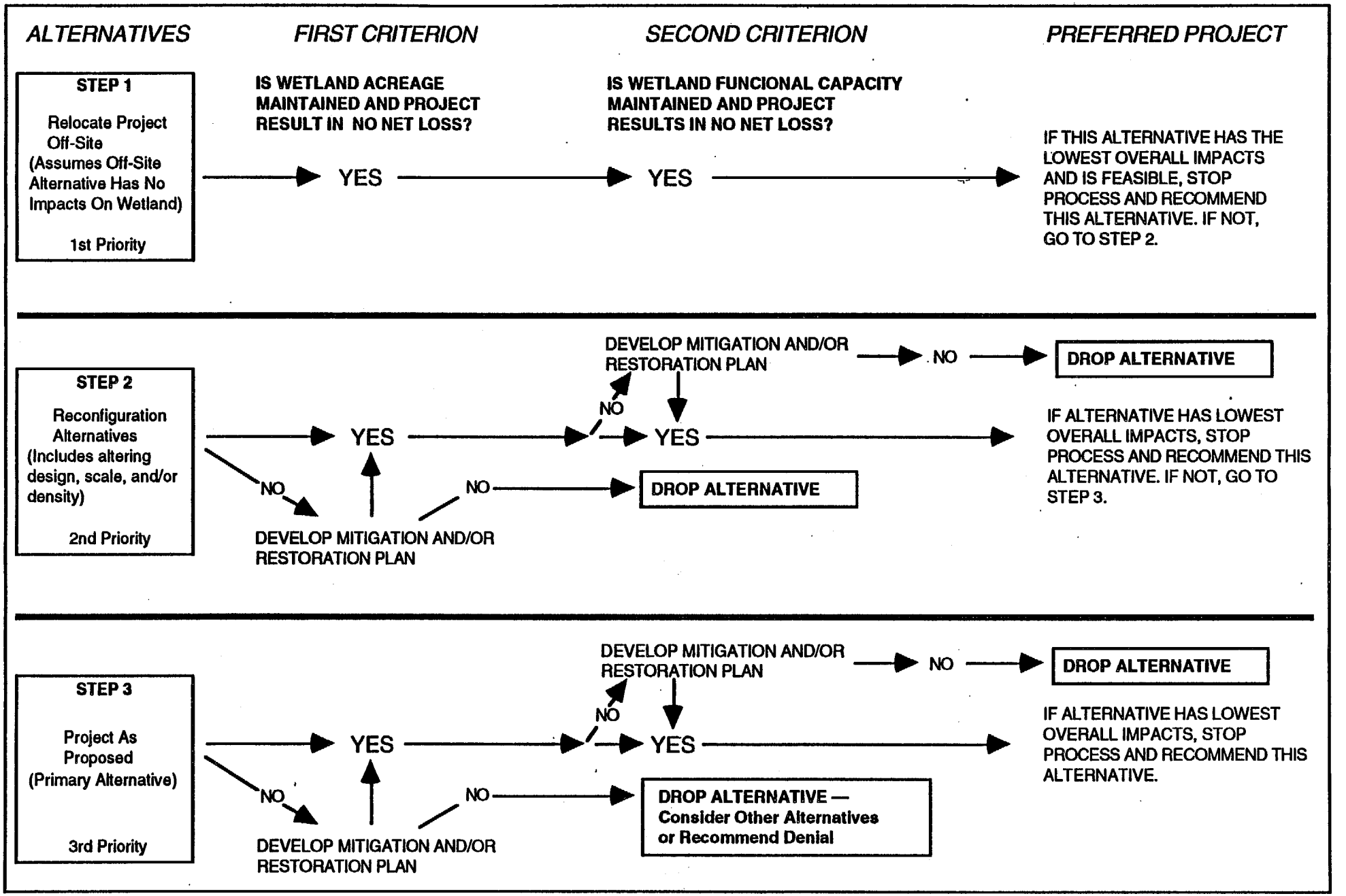
8 Feasible is defined in Section 30108 of the Coastal Act to mean "... capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors".

9 In fact one of the best ways to achieve a thorough alternative analysis is through the CEQA/NEPA process.

Figure 3

ALTERNATIVES ANALYSIS
DECISION MAKING MATRIX



preservation of wetland acreage. Above all, the analysis should focus on an objective assessment of the alternatives, and result in a clear, concise description with defensible findings.

Obviously, the least environmentally damaging alternative is total avoidance. That is, relocation or discontinuation (no project alternative) of the project so that any damage to the wetland is completely avoided. Other alternatives generally assume the project will be located in or adjacent to the wetland, but consider various types of reconfigurations such as changes in scale and density, or changes in project size – particularly building footprint – or shape. Presumably, any of these alternatives will impact the wetland and would therefore require a mitigation plan. However, the alternatives analysis should be confined to determining the least environmentally damaging feasible alternative and should not include an evaluation of any mitigation plans. If the least environmentally damaging feasible alternative is expected to adversely impact the wetland then the next phase of application review, evaluation of the mitigation plan must be completed.

As this discussion suggests, alternatives analysis is a complex process. The key to a good alternatives analysis, however, is a thorough objective review of all potential alternatives. Although the methods described here are fairly general, they do provide a consistent framework for the analysis, which will vary with the specifics of the project and the potential alternatives.

3) Mitigation:

The final test identified in Section 30233 requires an evaluation of the applicant's mitigation plan to determine if it is feasible and appropriate relative to the environmental impacts arising from the proposed project. All wetland development projects should include a mitigation plan, which if enacted will result in no net loss of wetland acreage or function.

Compensatory mitigation is the most common type of mitigation proposed in applications for coastal development permits. Although mitigation through compensation can take several forms, restoration projects are most often encountered by CCC staff[10]. If restoration is proposed, then a restoration plan must be developed prior to final permit review. The plan must answer specific questions regarding the adequacy of the proposed mitigation, and the overall consistency of the proposed

[10] For this discussion, restoration refers to the replacement or provision of substitute resources or environments, such as the re-establishment of a former wetland. Another type of mitigation, however, is restoration of the impacted site. Undoubtedly, this would be required of the applicant in any event, but additional mitigation would also be required for the resources lost through development. The restoration plans discussed here relate to this additional required mitigation.

mitigation with the policies of the Coastal Act. The following information applies only to the review of restoration plans for dredging, diking, and filling of wetlands. Chapter two of this document provides a more thorough discussion of available mitigation alternatives including other types of compensatory mitigation, in-lieu fees, mitigation banking, as well as more detailed information on restoration plans.

Various sections of the Coastal Act (e.g., 30411(b) and 30607.1), identify wetland restoration as a mitigation alternative for allowable wetland development projects. However, attempts at wetland restoration have generally met with limited success. The restoration of natural wetlands is not a short-term project. Many natural wetlands have taken thousands of years to reach their present form and function. Thus, it can be many years after a wetland is lost through development, before a wetland with similar form and function is completely re-established via restoration. One should proceed cautiously in recommending wetland restoration as mitigation for the loss of existing wetlands. Again, CCC staff should emphasize impact avoidance and protection of existing wetlands. The use of restoration projects should be reserved for those cases where there is no less environmentally damaging feasible alternative for an allowable use, and where there is no other feasible mitigation alternative.

The enhancement of degraded wetlands has also been considered a form of compensatory mitigation. Although this process can improve wetland functions (and therefore enhance the value), there is rarely a net increase in wetland acreage especially when the loss from the proposed development project is taken into account. Thus, considering the enhancement of degraded wetlands as acceptable mitigation for wetlands lost through development can lead to a net loss of wetland area.

Restoration projects involve the re-establishment of key wetland characteristics in <u>former wetland</u> areas, with the eventual goal of re-establishing a functionally productive and self-sustaining wetland. For example, breaching dikes to restore tidal action, removing fill material to restore proper elevations, and restoring the natural course of streams and rivers are all restoration processes that can result in the recreation of former wetlands. Section IV D(b)(2) of the Statewide Interpretive Guidelines offers the following guidelines in the use of restoration:

> *The applicant may, in some cases, be permitted to open equivalent areas to tidal action*[11] *or provide other sources of surface water. This method of mitigation would*

[11] A footnote for this section goes on to state " 'Opening up equivalent areas to tidal action' means to permanently open to tidal action former intertidal wetlands capable of providing equal or greater biological productivity. Mitigation measures should restore areas which are no longer functioning in a manner beneficial to wetland species. For example, returning a diked-off, formerly saltwater, but presently freshwater marsh to tidal action would not constitute mitigation. However, improving tidal flushing by removing tide gates, digging tidal channels and clearing culverts might qualify, if the

be appropriate if the applicant already owned filled, or diked areas which themselves were not environmentally sensitive habitat areas but would become so, if such areas were opened to tidal action or provided with other sources of surface water.

Restoration plans will vary depending on the type and extent of the impacts arising from the proposed development, and the available alternatives. The information presented here is only intended to provide general guidance in the review of such plans. Normally, the restoration plan should include provisions for starting restoration prior to project implementation; this approach gives the applicant an incentive to successfully implement the restoration plan. In addition, every restoration plan must include a detailed construction and management plan that:

- Identifies the habitat functions and values that will be created at the restoration site, and stipulates a time frame for achieving those functions and values.

- Establishes a maintenance program that provides for repairs, modifications, and maintenance of the restoration site to ensure that the restoration goals are achieved and maintained. These procedures should also include specific remedies in the event the mitigation project does not meet the designated goals

- Establishes a monitoring program (including reporting of results) that provides detailed information about the restored area over time to permit an accurate determination of whether the restoration goals have been met.

- Assures the applicant is legally bound as totally responsible for implementation and completion of the restoration project prior to or concurrent with construction of the proposed wetland development project.

- Assures that prior to commencement of the development project, the restoration site will be purchased and dedicated to a public agency, or otherwise permanently designated as open space.

- Presents convincing evidence that the restoration site is located in an area no longer functioning in a manner beneficial to wetland species or other organisms, such as a former productive wetland or estuary that currently exists as unproductive dry land.

- Presents convincing evidence that the site can be restored to equal or greater biological productivity when compared to the area lost through development. At a minimum, the restoration site must provide equivalent or greater habitat

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Commission determines that such actions would restore an area to equal or greater habitat value than the area lost."

values to the same type and variety of plant and animal species that use the proposed development site (CCC, 1981).

- Shows that the restoration site is located in the same general region (e.g., the same watershed) as the proposed development site.

In contrast, a proposed restoration area should **not** be used as a mitigation site if it contains any of the following characteristics:

- The area constitutes a locally and/or regionally significant area of upland or transitional wetland habitat.

- The area contains special status species (e.g., threatened or endangered species), or locally or regionally unique plants or animals.

- The area serves as an essential ecological component to an adjacent wetland area, such as a buffer zone or transitional upland habitat.

In addition to the general guidelines for restoration plans, there are also specific considerations for wetland dredging that can reduce the project impacts, and potentially the mitigation requirements. Where a dredging operation is proposed, Section 30233(b) of the Coastal Act provides that:

> *Dredging and spoils disposal shall be planned and carried out to avoid significant disruption of marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*

Furthermore, Statewide Interpretive Guidelines Section IV D(2)(a)(2) reinforces Section 30233(b) through the following statement:

> *Limitations may be imposed on the timing of the* [dredging] *operation, the type of operation, the quantity of dredged material removed, and the location of the spoil site.*

These special considerations for dredging focus on the logistics and methods of the operation. All mitigation plans for dredging impacts should take these logistical and methodological constraints into account.

All of the previously described processes for evaluating proposed wetland development projects assume staff are made aware of a project through normal notification or application procedures. However, these processes may also apply in the examination and evaluation of illegal activities. Once a violation (for example constructing a building in a coastal wetland without a coastal development permit) is

discovered the property owner is in most cases required to apply for an after-the-fact permit. Analysis of this application would follow the same steps outlined above for a normal coastal development permit, and may or may not result in permit approval. Further enforcement and penalties in connection with the violation are determined separately.

IV. WETLAND IDENTIFICATION AND DELINEATION:

All coastal development permit applications proposing development in a wetland must include a map delineating the wetland area[12]. A wetland delineation map identifies the wetland's location and pinpoints the boundary line between the wetland and adjacent upland area by determining the extent of one or more key wetland characteristics: hydrology, hydric soils, and hydrophytic vegetation. Other resources such as aerial photographs, national wetland inventory maps, and soil conservation maps may also prove useful in determining the location and size of a wetland. CCC staff must review the resulting delineation map and supporting information carefully, because the delineation results can vary depending on the wetland definition and delineation procedure used (see chapter three for more information).

In the coastal zone, the CCC, with assistance from the DFG, is responsible for determining the presence and size of wetlands subject to regulation under the Coastal Act. The local government also has a direct role in the identification and delineation process in areas with a certified local coastal program. Although the exact procedure has varied somewhat in the past, the DFG wetland definition and classification system (described in chapter three) is the delineation methodology generally followed by the CCC. For wetland development projects requiring Army Corps of Engineers (ACOE) review, the applicant may, in some cases, need to obtain two delineations, one for the coastal development permit, and another for the ACOE Section 404 permit.

A number of ecologically distinct wetland types occur in California, and these ecological differences can also affect the identification and delineation of wetlands. The subject of wetland ecology is discussed further in other parts (particularly chapter four) of this document, but some points relevant to this section are introduced here. In addition to the more traditional fresh- and salt-water marshes, the California coastal zone also contains a number of riparian areas, most often occurring as corridors along streams and rivers. Resource and regulatory agencies have found it hard to strictly define riparian areas as wetlands because of the often transient hydrology, the absence of hydric soils, and the heterogeneous vegetation composition. Yet riparian areas do exhibit many of the functions and values found in other wetlands. In the past, CCC

[12] In determining project related impacts the CCC considers the wetland as it currently exists and not as it may have existed historically. Thus, the accuracy of a wetland delineation is determined, in part, by how recently is was completed.

staff have recognized riparian areas as "environmentally sensitive areas" within the meaning of Coastal Act section 30107.5, and then regulated development through Section 30240. Additionally, Sections 30231 and 30236 provide for the protection of many riparian areas. The semi-arid climate of Southern California also presents problems for the identification and delineation of wetlands. Some wetlands in this part of California can remain dry for one or more seasons due to the Mediterranean climate. Many of the information sources listed above can assist CCC staff in identifying such seasonally wet wetlands. Additionally, Ferren and Fiedler (1993) have developed a technical description useful for identifying wetlands in Central and Southern California.

As evidenced by this brief discussion, accurate wetland identification and delineation can be challenging. CCC staff are encouraged to work with the DFG, the ACOE, local government and any other applicable agencies to minimize delays relating to wetland delineation. Early communication can go a long way to preventing problems later on.

V. ESTABLISHING BUFFER AREAS:

Buffer areas are undeveloped lands surrounding wetlands. These areas act to protect the wetland from the direct effects of nearby disturbance (both acute and chronic), and provide necessary habitat for organisms that spend only a portion of their life in the wetland such as amphibians, reptiles, birds, and mammals. A buffer area should be an integral component of any proposed development project located within or adjacent to a wetland. Buffers should have all of the following characteristics:

1) Buffer width should be a minimum of 100 feet (CCC, 1981)[13]. In some cases, such as when a species requires habitat adjacent to a wetland for part of its life or when nearby development poses increased hazards to a wetland or wetland species, larger buffer areas should be considered.

2) Buffers should work to minimize the disturbance to a wetland from adjacent development. If the adjacent development includes residential areas, the buffer must include a fence and/or a natural (e.g., vegetation or water) barrier to control the entry of domestic animals and humans into the wetland. The buffer should also provide for visual screening in those cases where resident or migratory wetland species are particularly sensitive to human impacts. The use of walls, berms and other barriers should be considered where excessive artificial light or noise is a problem.

[13] In Southern California, the CCC has typically required 100 foot buffers for fresh- and salt-water wetlands and 50 foot buffers for riparian areas. Riparian areas (as defined in the glossary) are considered environmentally sensitive areas, but for a variety of reasons have not always received the same treatment as other types of wetlands.

3) Buffers should be designed, where necessary, to help minimize the effects of erosion, sedimentation, and pollution arising from urban, industrial, and agricultural activities. However, to the extent possible, erosion, sedimentation, and pollution control problems should be dealt with at the source not in the wetland or buffer area. Sources of pollution include point and non-point source discharges into the watershed and air, domestic and industrial garbage and debris, and biological pollution arising from the introduction of exotic organisms. Regular maintenance must be provided for any devices (e.g., silt or grease traps) built in the buffer zone.

4) Buffers should provide habitat for species residing in the transitional zone between wetlands and uplands. All project designs should consider the movement of food and energy between habitats as well as the life cycles of organisms that feed or reproduce in the wetland but generally reside outside the wetland. Any revegetation work in the buffer area should use native species from local sources.

5) Buffers should allow for passive recreational uses within the area, only if it can be shown that these uses will not adversely impact the wetland ecosystem or the buffer's function as described in the above criteria. 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 impact to plants and animals.

VI. DETERMINING FUNCTIONAL CAPACITY:

A functional capacity analysis must be included as part of the application for a coastal development permit. Since the determination of functional capacity is a scientific one, it must be made by a qualified ecologist. CCC staff review of the wetland functional capacity analysis is among the most important elements of the permit application review process. The functional capacity analysis assists CCC staff in determining whether a development project will diminish the overall capacity of a wetland to function as an integrated ecosystem. **Maintaining the functional capacity means maintaining the same level and number of species, maintaining the same level of biological productivity, and maintaining the same relative size and number of habitats.** Functional capacity analysis is also an important part of the alternatives analysis discussed above. Finally, functional capacity analysis is one method available for determining the appropriateness of any proposed mitigation; however, compensatory mitigation is not a substitute for maintaining the functional capacity of the impacted wetland.

California coastal wetlands have a number of important functions and values, which have increased in relative importance because of the enormous wetland losses that have

occurred throughout California. In general, wetland functions are those processes that directly or indirectly result in values that benefit humans or other organisms, or values perceived by humans as desirable or worthy of protection. All of the known functions and values of coastal wetlands are a manifestation of one or more of the physical, chemical, or biological processes inherent to wetlands. Determinations of functional capacity must consider each of these components in the overall assessment. (See chapter four, for a further discussion of wetland functions and values.)

Determining the functions and values of seasonally wet wetlands (often referred to as seasonal wetlands) can be a contentious issue for resource and regulatory agencies. Because of their transient nature, it is argued that seasonally wet wetlands are more limited in function, and therefore of lower value than perennially wet wetlands. While the transient hydrology of seasonally wetlands may reduce the time period of a function, the performance of that function and its overall value are not necessarily diminished relative to perennially wet wetlands. In fact, many of the same functions and values present in both types of wetlands. Additionally, seasonally wet wetlands can, during certain times of the year, provide greater value for certain functions (e.g., ground water recharge, floodwater storage, habitat for endangered species, or feeding and resting spots for migratory birds), relative to nearby perennially wet wetlands.

Functional capacity determinations of wetlands considered "marginal" can also be problematic. "Marginal wetland" is an arbitrary term that is generally applied without a technical basis. A marginal wetland may or may not qualify as a "degraded wetland" (Coastal Act Section 30411). Marginal wetlands may be seasonal or perennial, and are sometimes considered less important because of their location (e.g., small isolated areas), reduced species diversity, or reduced habitat complexity. Nevertheless, marginal wetlands do provide important functions and values, which may be of special significance on a local or regional level. For example, some marginal wetlands provide unique or rare habitat that may in turn be vitally important to a threatened or endangered species. Such a wetland would also have important educational and scientific value.

CHAPTER TWO

AN OVERVIEW OF MITIGATION PROCESSES AND PROCEDURES

I. INTRODUCTION:

Mitigation for the adverse affects of development projects in wetlands can take on a variety of forms. Compensatory mitigation (enhancement, restoration, or creation) is the most common mitigation proposed in coastal development permit applications. However, under certain circumstances the CCC has also accepted less desirable mitigation alternatives such as in-lieu fees and contributions to mitigation banks. Although a variety of mitigation alternatives exist, all of them have drawbacks and limitations. (Not the least of which is the large amount of money often required to undertake a mitigation program.) Numerous partially successful, or failed mitigation projects attest to the fact that mitigation is not a panacea. Past experience clearly shows a great deal of effort is required by all parties to ensure successful mitigation.

This chapter presents a brief overview of several common mitigation alternatives for proposed projects directly affecting wetlands. Additionally, the chapter presents information on mitigation ratios, and more detailed information on restoration plans.

II. MITIGATION DEFINED:

Although the Coastal Act does not define mitigation, the California Environmental Quality Act does. Under CEQA, mitigation includes all of the following:

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

b) *Minimizing impact 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.*

This definition is hierarchical with avoidance being the most preferred type of mitigation and compensation being the least preferred type.

Past experience in reviewing applications for coastal development permits shows applicants rely heavily on compensatory mitigation to minimize habitat loss, regardless of the impacts. Typically, compensation measures are included as an integral part of the project design. This form of mitigation is often justified through arguments designed to show that the wetland acreage enhanced or restored is equal to the acreage lost. However, this concept of compensatory mitigation often fails to recognize the complexity of the wetland ecosystem, its relationship to the watershed, and the fact that wetland functions may not be directly related to acreage. Additionally, the success of compensatory mitigation – especially restoration projects – is not proven. Overall, more emphasis should be placed on mitigation alternatives that include wetland impact avoidance and minimization. Compensation for wetland impacts should only be considered as the last alternative, and only if there are no other less environmentally damaging feasible alternatives.

III. TYPES OF MITIGATION:

A) Avoidance:

Avoidance of project impacts is the preferred mitigation alternative under CEQA. Through this form of mitigation, adverse impacts are avoided altogether through alteration of project location, design, or other related aspects. For obvious reasons, this mitigation alternative is not generally preferred by permit applicants, since it requires a change (possible substantial) in the proposed project. Yet in evaluating mitigation alternatives, CCC staff should give first consideration to impact avoidance for all or some of the proposed project impacts.

B) Enhancement, Restoration, and Creation:

The enhancement, restoration, or creation of wetlands are three types of compensatory mitigation. In this document, enhancement is considered a mitigation activity that improves the size or function of degraded or other existing wetlands. Restoration is considered a mitigation activity that re-establishes a former wetland. Creation is considered a mitigation activity that results in the formation of a new wetland.

Although not without drawbacks, enhancement of an existing wetland is among the most common type of compensatory mitigation. The principal shortcoming of most proposed enhancement projects is that they can often result in a net loss of wetland acreage (Table 1). Only through the restoration of former wetlands or through the

Table 1

A COMPARISON AMONG COMMONLY PROPOSED TYPES OF WETLAND COMPENSATORY MITIGATION PROJECTS

Type of Mitigation	Advantages	Disadvantages
Enhancement of degraded wetlands with some existing functional value.	Good chances of success, since project located in an existing wetland ecosystem.	Net loss of wetland area and/or functions.
Restoration of former wetlands area with no present functional value.	Net gain of wetland acreage and function. Success rate higher than for projects creating new wetlands.	Still somewhat experimental. May be a long time between loss of developed wetland and completion of the restoration project.
Creation of a new wetland site not adjacent to existing wetland.	Provides greater flexibility for mitigating impacts.	Still experimental. Success rate is low. Functional value not well documented.

creation of new wetlands can no-net-loss be achieved. Enhancing existing (e.g., degraded) wetlands as mitigation for wetland resources does not provide additional wetland acreage, but can increase the function and value of existing habitat.

CCC staff should review wetland enhancement projects carefully. All wetlands in coastal California are extremely valuable, even if degraded, because of the dramatic loss in wetlands throughout the State, and the unique habitats wetlands provide. In urban areas, the remaining wetlands still support important plant and animal species. Though many of these wetlands are disturbed by human activities, they can still be a significant resource.

In contrast to enhancement projects, the restoration of a former wetland can result in a net increase in both wetland acreage and function (Table 1). Restoration of a former wetland is by no means foolproof, but may have a reasonable chance of re-establishing fundamental wetland characteristics such as the proper elevation or hydrology. However, having no guarantee the restoration project will achieve the stated goals in the specified time frame is a major concern regarding wetland restoration. To provide a higher probability of success, the restoration project should be located adjacent to a functioning wetland. Isolated restoration sites will probably have a lower chance of sustaining maximum function and values, due to isolation from seed sources, and limitations on the migration and dispersion of wetland animals. Established

connections among wetlands can be critically important in the event of local catastrophes, which can result in localized extinction without inputs from other wetlands.

The creation of a new wetland is probably the most uncertain type of compensatory mitigation (Table 1). Not only must the project provide the proper form and balance of fundamental characteristics, but it must also result in a system that is self-sustaining or provide for a permanent maintenance program. Creating new wetlands has many of the problems associated with wetland enhancement and restoration projects. Additionally, it can be a very long time from the creation of a new wetland to the establishment of functions and values equal to those lost through development. Thus, there is an interim (often permanent) loss of functions and values. CCC staff should be very cautious in recommending wetland creation projects as mitigation for the loss of existing wetlands.

C) In-Lieu Fees and Wetland Mitigation Banks:

In-lieu fees and wetland mitigation banks are two types of compensatory mitigation that result in the applicant allocating funds for the augmentation of wetlands. Typically, in-lieu fees are funds placed in one or more accounts designated for restoration, enhancement, or preservation of existing wetland resources. In contrast, wetland mitigation banks are either existing or newly created wetland areas that are available for purchase and subsequent management and preservation. In practice, funds paid by the applicant are used to purchase a portion (i.e., credits) of an existing wetland mitigation bank, or are used to fund the creation of a new bank. Using a pre-negotiated formula, the applicant draws on the purchased credits to mitigate for wetland impacts arising from the development project.

In-lieu fees and mitigation bank purchases have generally met with limited success in serving as adequate mitigation for wetland losses. As previously discussed, there are numerous technical difficulties inherent to wetland creation and restoration. Additionally, the allocation of funds through these alternatives are generally not tied to a specific type of mitigation. Thus, there is a reduced chance for in-kind mitigation, and even less chance the mitigation site will be near the impact site. Project time lags can also reduce the overall success of mitigation due to the loss of wetland functions between the time of adverse impacts, the collection of adequate funds to undertake the project, and completion of the mitigation project. Resource management agencies have also found that the complete cost of mitigation is not always accounted for in the fees collected, while mitigation bank funds are not always adequate to implement the bank project in a timely fashion. Wetland restoration costs remain high —particularly the purchase of coastal property— especially in southern California, where land is extremely expensive.

Mitigation banks raise special problems of their own. More often than not, the promised mitigation is never realized. Simply put, resource scientists do not know how to build sustainable wetlands that match the functions and productivity of natural wetlands. Thus, any broad use of mitigation banks could lead to a net loss of wetland habitat. Moreover, resource agencies are concerned that the creation of mitigation banks will reduce the barriers to filling wetlands and estuaries, and may even encourage projects, as bank sponsors seek to recover their costs. On a broader scale, there is strong interest at many levels of government in formalizing the mitigation bank process and expanding its use as a viable mitigation alternative for wetland impacts. Nevertheless, it is recommended that CCC staff coordinate with resource agencies to determine the success of a mitigation bank's activities **prior** to recommending an applicant's involvement in the bank as mitigation for wetland development impacts.

In-lieu fees or contributions to wetland mitigation banks should not be used because the applicant is having difficulty in locating a suitable mitigation site. Often this approach only transfers the problem of locating an appropriate mitigation site to a public agency. CCC staff are encouraged to work with the applicant to reach an environmentally acceptable decision regarding mitigation prior to initiation of the project.

In evaluating various mitigation options, CCC staff should remember that mitigation banks and in-lieu fees are alternatives not solutions. Mitigation banks and in-lieu fees are forms of compensatory mitigation, which under CEQA is the least preferred alternative.

IV. MITIGATION RATIOS:

When an applicant proposes to restore or create a wetland as mitigation for impacts from development, the CCC must determine if the quantity and quality of the proposed mitigation will adequately compensate for the wetland area lost through development. Resource and regulatory agencies have usually required additional acreage beyond that lost through development, because of interim losses in wetland acreage and functional capacity, and because the success and resulting value of compensatory mitigation projects are uncertain. The ratio of wetland acreage created or restored to the wetland acreage lost to development is termed the wetland replacement ratio or mitigation ratio. Wetland replacement ratios may vary depending on the acreage, functions, and values of the wetland lost to development and the type of mitigation proposed.

To refine and standardize the process of determining mitigation ratios, some agencies have relied on technically based habitat evaluation methods such as the Habitat Evaluation Procedure (HEP) and the Wetland Evaluation Technique (WET). These procedures are complex and include evaluation criteria that are both objective and subjective. Unfortunately, several of the evaluation criteria do not accurately account

for the ecological processes present in California's coastal wetlands and this is a major difficulty with the use of HEP and WET in California (Onuf and Quammen, 1985). In an attempt to address this problem a modified version of HEP was developed for use in evaluating California's coastal wetlands. However, this modified HEP has been characterized as even more subjective than the original procedure. Additionally, the use of these methods can result in erroneous information under certain situations. For example, through these techniques it is possible to conclude that a smaller wetland restored to a higher value offsets the loss of a larger wetland with lower values (e.g., a degraded wetland). Finally, a full evaluation under HEP or WET is very involved requiring a great deal of biological, physical, and chemical information. Unfortunately, the required information is often incomplete or nonexistent for many of California's coastal wetlands, rendering completion of these procedures unrealistic.

Because of the controversy and inherent problems associated with HEP and WET, CCC staff are discouraged from using information and results from these procedures to determine wetland replacement ratios. The preferred procedure is to use the results from the functional capacity analysis (see chapter one), which provides for the preservation of both wetland acreage and functional capacity, in evaluating the adequacy of compensatory mitigation and mitigation ratios. In determining if functional capacity is maintained, both the adverse impacts and the proposed mitigation must be evaluated. In order to maintain functional capacity and wetland acreage, a mitigation plan should at least include the following:

- A wetland mitigation ratio in excess of one to one (i.e., one wetland acre must be restored or created for each acre lost through development). Many coastal development permits[14] have required a mitigation ratio of four to one to compensate for wetland acreage and functional capacity lost during the re-establishment and maturation of the mitigation area. In some cases, larger mitigation ratios have been required to ensure that at least some compensation occurs in the event the mitigation project is only partially successful. Enhancement of degraded habitat may be included as a **component** of a mitigation plan if the total package results in an acceptable mitigation ratio.

- Wetland creation projects should be located adjacent to existing wetland habitat whenever possible, to increase the probability for success.

- Wetland creation projects should replace the same habitat type, preferably in the same watershed or area. However, if a regional management plan has been prepared for the area that demonstrates the need for a specific habitat type, the CCC **may consider** replacement with the identified critical habitat, provided that

[14] For specific examples see permit numbers 5-90-913, 5-92-408, 5-93-276, 6-86-2, 6-87-611, 6-87-667, 6-88-277, 6-88-388, 6-89-195, 6-90-219, 6-90-77.

this replacement is endorsed by the appropriate fish and wildlife management agencies.

V. ENHANCEMENT AND RESTORATION:

A. Effectiveness of Enhancement and Restoration:

Wetland enhancement and restoration projects are among the most common types of wetland mitigation submitted with coastal development permit applications. Wetland enhancement and restoration efforts in California have been criticized because of an overall failure to fulfill the goal of no net loss and a failure to replace lost wetland values. These failures are due to many factors, including a lack of project completion, limited project success, and unclear goals and evaluation criteria. For example, in a review of 58 wetland mitigation projects in the San Francisco Bay area, Eliot (1985) found that very few of the projects achieved the stated goals. Additionally, Maguire (1985) identified the inability to accurately evaluate the effectiveness of restoration projects as a continuing problem because of:

- Unclear objectives.
- Insufficient technical detail in the design.
- Inadequate identification of the type and quantity of habitat lost through development.
- Inadequate baseline data regarding the biological, physical, and chemical condition of the restoration area.

However, a more recent study by Josselyn et al. (1993) found that 13 out of 22 (59%) Coastal Conservancy sponsored wetland restoration projects were effective in meeting initial project goals. This success rate is high compared to results of evaluations focusing on wetland mitigation projects (Josselyn et al., 1990). This higher success rate was expected due to the extensive planning that goes into Conservancy projects, the frequent interaction among various resource and regulatory agencies and the Conservancy, and the funding of project grantees who have a genuine interest in restoring wetlands (Josselyn et al., 1993). While wetland mitigation success remains low, the results of Conservancy sponsored projects suggests the potential exists for increasing the success rate.

B. Designing an Effective Enhancement or Restoration Plan:

The creation of a well designed enhancement or restoration plan is a complex process involving all of the following:

- Determination of regional habitat goals.
- Determination of enhancement or restoration goals and objectives.
- Detailed documentation of on-site conditions.
- Comparison of on-site conditions with regional goals and selecting priority species and habitats for the mitigation area.
- A detailed description of the post- enhancement or restoration environment and essential components, and a description of the materials and methods used to achieve that environment.
- A detailed and comprehensive review of the enhancement or restoration plan and revision as necessary.
- Development of the final plan.

The following is a list of design criteria and standards that should be used by applicants in developing an enhancement or restoration plan[15]:

1) *Maximize the chances for success:* If a wetland mitigation plan proposes to enhance a degraded wetland area, then enhancement should ultimately improve the function and values with the least amount of habitat modification. Using enhancement of degraded wetlands as mitigation is discouraged because there is often a net loss of wetland area, especially when the area lost through development is considered. However, incorporating an existing wetland ecosystem (no matter how disturbed) into the mitigation plan can dramatically improve the chances of a successful project over creating new, isolated wetlands. An existing wetland will serve as a reservoir of biota that can colonize restored areas and ensure long-term survival of the wetland. Since most new wetlands are isolated, they will not have this reservoir to draw from, and it will be difficult for the wetland to attain the level of diversity and function of a self-sustaining wetland ecosystem.

[15] For further information on this subject, the reader should consult other published documents, such as *Salt Marsh Restoration* (Zedler, 1984), and *Marsh Restoration in San Francisco Bay: A Guide to Design and Plan* (Josselyn, 1984), and references within.

2) *Maximize wetland size:* Mitigation plans should strive to maximize wetland size by choosing sites adjacent to or connected with existing functional wetlands. Such plans must also include provisions for the appropriate habitats (e.g., open water, marshland vegetation, mudflat, etc.) in the proper proportions. Large consolidated areas can offer larger habitats and a greater number of habitats resulting in greater species diversity and population size. However, this criterion should not be interpreted as justification to consolidate remaining wetland acreage into "wetland reservations", which would result in a loss of important adjacent upland habitat and can work against the existence of rare species and habitats.

3) *Maintain linkages between wetlands:* Where two or more wetland habitats or systems are connected, a mitigation plan should maintain these linkages. Wetland connections should not be severed by development. These connections are vitally important as migration corridors and transition zones between wetlands and adjacent habitats. These connections are also critical for the recolonization of wetlands that suffer local catastrophes such as lagoon closures, or episodes of acute toxicity.

4) *Establish and maintain buffer areas:* Buffer areas are undeveloped lands surrounding wetlands. These areas act to protect the wetland from the direct effects of nearby disturbance (both acute and chronic), and provide habitat for organisms that spend only a portion of their life in the wetland such as amphibians, reptiles, birds and mammals. (See chapter one for more information on buffers.)

5) *Use of existing vegetation and soil:* Mitigation projects should strive to salvage the wetland vegetation and topsoil removed during construction for use in the mitigation area. Additional plant material should be drawn from local sources so that local gene pools are maintained. Non-native wetland plants or plants and soils from different regions should not be used at the restoration site.

6) *Revegetation:* The success of revegetation can be enhanced by planting species at their elevation of greatest natural abundance and in soils with a salinity no higher than those found in the native habitat. In addition, transplanted vegetation may require additional maintenance, such as watering or enclosures to prevent grazing, until they become established.

7) *Consider elevation and topography:* The elevation and topography of wetland areas is critical to determining the hydrologic regime and the resulting habitats. Elevation changes on the order of centimeters can have dramatic effects on the wetland ecosystem. Not only must the elevations be determined accurately, there must be sufficient detail so that an overall understanding of the landscape topography is clear. For example, intertidal habitat should slope towards the channel at an even grade of one to two percent to reduce ponding and maximize the intertidal area.

8) *Consider Hydrology:* The source and supply of water to the wetland is key to determining the overall structure of the ecosystem. For wetlands connected to the ocean, the tidal prism must be sufficient to provide adequate exchange of saltwater over the tidal cycle. This is especially important in lagoons where closure of the lagoon mouth may or may not be a natural phenomenon. Designs for new wetlands must incorporate protection from the direct force of waves and tidal currents. Fresh water sources must also be accounted for in the mitigation design. Freshwater supply can vary dramatically throughout the year in many parts of California. The mitigation design should also consider the beneficial flood control function of a wetland.

9) *Minimize sedimentation:* If excessive sedimentation is a potential problem, then the mitigation plan must include sediment basins and/or maintenance dredging programs to control the build-up of sediments. The plan should encourage the use of upstream sediment controls, including prohibition of grading during the rainy season, stabilization of slopes prior to the rainy season, and protection of native vegetation on steep slopes and stream banks.

10) *Construction timing:* In order to minimize the disturbance to existing wetland habitat, mitigation projects should avoid active periods of reproduction, growth, or migration of wetland species.

C. Contents of an Enhancement or Restoration Plan:

The following list of criteria is intended to assist applicants in preparing an enhancement or restoration plan, and CCC staff in reviewing such plans. At a minimum, an acceptable plan will include:

1) Clearly stated objectives and goals consistent with regional habitat goals. These regional goals must identify functions and or habitats most in need of enhancement or restoration and must be as specific as possible. If the regional goals have not been identified, then the applicant and CCC staff should work with relevant federal, State, or local agencies to determine if the proposed plan is consistent with the ecology and natural resource composition of the area.

2) Adequate baseline data regarding the biological, physical, and chemical criteria for the mitigation area.

3) Documentation that the project will continue to function as a viable wetland over the long term.

4) Sufficient technical detail in the project design including, at a minimum, an engineered grading plan and water control structures, methods for conserving or stockpiling topsoil, a planting program including removal of exotic species, a list of all species to be planted, sources of seeds and/or plants, timing of planting, plant locations and elevations on the mitigation site base map, and maintenance techniques.

5) Documentation of performance standards, which provide a mechanism for making adjustments to the mitigation site when it is determined through monitoring, or other means that the enhancement or restoration techniques are not working.

6) Documentation of the necessary management and maintenance requirements, and provisions for remediation should the need arise.

7) An implementation plan that demonstrates there is sufficient scientific expertise, supervision, and financial resources to carry out the proposed activities.

8) A monitoring program (see below for more details).

D. Basic Standards for a Monitoring Plan:

A monitoring plan is a critical component of an enhancement or restoration plan that provides an objective way to evaluate the success of the project. When properly conducted, monitoring provides invaluable information regarding:

- Assurance that the mitigation project is meeting the stated goals.
- Identification of major problems or flaws in the mitigation area.
- Ways to improve future wetland enhancement or restoration plans.

The monitoring program is intended to document changes in the physical, chemical, and biological status of the mitigation area through the collection and analysis of relevant data. The monitoring plan should include the following components:

1) Provisions for independent monitoring of the site at least five years **after** completion of the mitigation project. The intent is to continue monitoring until the project has successfully met the stated goals and objectives. For larger projects where new wetlands are created, extended monitoring will be required.

2) Repetitive surveys for plants and animals (including species of special concern) throughout the various habitats of the mitigation area. The surveys should use

techniques that permit a determination of species composition and abundance. Both terrestrial and aquatic organisms should be surveyed. Timing of the surveys should be considered, since the abundance of many plant and animal species often varies with season. Surveys sufficient to characterize the mitigation site should also be completed **prior** to any enhancement or restoration activities.

3) Monitoring of hydrology. For tidal wetlands this would include a determination of the areas inundated at high and low tide, tidal prism, and water velocity. For non-tidal wetlands, this would include determination of permanent and seasonal patterns of inundation and water sources.

4) Monitoring of water quality. Repetitive sampling of various chemical and physical constituents such as salinity, pH, nutrient concentration, dissolved oxygen, temperature, and turbidity throughout the year. The sampling pattern may vary throughout the year and may include more intensive sampling over several tidal cycles to determine short-term salinity patterns.

5) Monitoring of soil chemistry. This will serve primarily to document trends in soil salinity in tidal wetlands, but may include measurements of other constituents as required.

6) Ongoing procedures for the identification and correction of problems as they arise. Such problems may be related to the physical, chemical, or biological attributes of the mitigation site, or difficulties in meeting enhancement or restoration objectives and timelines. These procedures should include specific remedies in case the mitigation project does not meet the designated goals.

7) Provisions for timely analysis and production of annual reports. These reports will be distributed to the CCC and other interested parties. The final monitoring report, submitted upon completion of the monitoring program, should analyze all monitoring data and presents different management options.

CHAPTER THREE

PROTECTION AND MANAGEMENT OF WETLANDS IN THE CALIFORNIA COASTAL ZONE: A REVIEW OF RELEVANT AGENCIES AND PROCESSES

I. INTRODUCTION:

Numerous processes, policies, and regulations issued from all levels of government have dramatically influenced the amount and quality of wetlands in California since the early 1800's. Early on, much of the interest in wetlands focused on their "reclamation" for agriculture. More recently, however, interest has focused on the preservation and restoration of wetlands in California, resulting in protection oriented policies and regulations. Currently, a complex network of government agencies is responsible for enforcing the many rules and regulations pertaining to wetland management and protection. Although a few statutes and directives are specific to wetlands, most of the regulatory influence over wetlands occurs indirectly through management or regulation of water quality and quantity, fish and wildlife, endangered species habitat, water navigation, floodplain control, public trust, coastal resources, and environmental land use regulations (Dennis and Marcus, 1984). However, even with the myriad of regulatory measures, wetland resources throughout the State do not receive equal protection. Moreover, implementation within and among government agencies is inconsistent. In short, California is currently lacking a fully implemented comprehensive policy for the management and protection of its wetlands.

More recent activities, however, should improve the current situation. Specifically, the Wilson administration (State) and the Clinton administration (federal) released wetland policy statements in August 1993, which are designed to provide a consistent policy framework for the management and protection of wetlands. These policy statements detail a series of action items and initiatives designed to achieve three principal goals: 1) ensure no net loss of wetlands; 2) reduce procedural complexity; and 3) develop private and public partnerships to encourage wetland conservation and protection. Implemetation of these policy statements is underway.

This chapter presents a review of the relevant agencies, processes, and policies affecting California's wetlands. Topics covered include: 1) definition and classification of wetlands; 2) agencies and regulations relating to wetlands; and 3) existing management practices. The focus is on wetlands occurring in the coastal zone. This chapter is not

intended to present an exhaustive review, but rather to give the reader a basic level of understanding and a sense of the current regulatory procedures. The subjects covered here are complex. The reader is encouraged to consult the referenced literature for additional information.

II. DEFINITION AND CLASSIFICATION OF WETLANDS:

The lack of a single definition for a wetland is one of the more problematic issues affecting wise stewardship of this resource. The use of different definitions by regulatory and resource agencies has lead to unequal protection of California's wetland resources and inconsistencies in evaluating the existence and management of wetlands. All of the regulatory processes related to wetland protection and development apply only after the existence of a wetland is established. Thus, the criteria and processes used to define a wetland are central to determining which regulations apply and to what extent they are applied.

The word wetland is a relatively new term used to describe a particular landscape known throughout the world by a variety of names (e.g., swamp, bog, fen, mud flat, mire, and marsh). In fact, many of the terms used to define a wetland were developed as a way to describe the more obvious characteristics that exist within this landscape. Fundamentally, a wetland is land that remains wet long enough to result in the alteration of key physical, chemical, and biological elements relative to the surrounding landscape. However, the complex nature of wetlands requires a more elaborate definition, one which accounts for their variable nature and their subtle, but important, features.

A. Definition and Classification by Federal Agencies:

Several definitions for a wetland are applied by numerous State and federal resource and regulatory agencies, and this combined with the complex nature of wetlands has resulted in public confusion and frustration. The United States Army Corps of Engineers (ACOE), the Environmental Protection Agency (EPA), and the United States Fish and Wildlife Service (FWS) have developed the two definitions most commonly used by federal, State, and local agencies. The ACOE and EPA definition for a wetland (hereafter referred to as the ACOE definition) is probably used most often throughout the United States because of the ACOE's direct permit authority over development in wetlands and deepwater areas, and because the definition has been upheld in several courts of law.

The ACOE definition is often referred to as a "three parameter definition" because three key parameters: hydrology, soil, and vegetation must all occur and meet the defined

characteristics in order for a location to be classified a wetland. The ACOE definition (Environmental Laboratory, 1987) reads as follows:

The following definition, diagnostic environmental characteristics, and technical approach comprise a guideline for the identification and delineation of wetlands.

a. *Definition: The ACOE (Federal Register, Section 328.3(b), 1991) and the EPA (Federal Register, Section 230.4(t), 1991) jointly define wetlands as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

b. *Diagnostic environmental characteristics: Wetlands have the following general diagnostic environmental characteristics:*

   1. *Vegetation: The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described in (a) above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.*

   2. *Soil: Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions.*

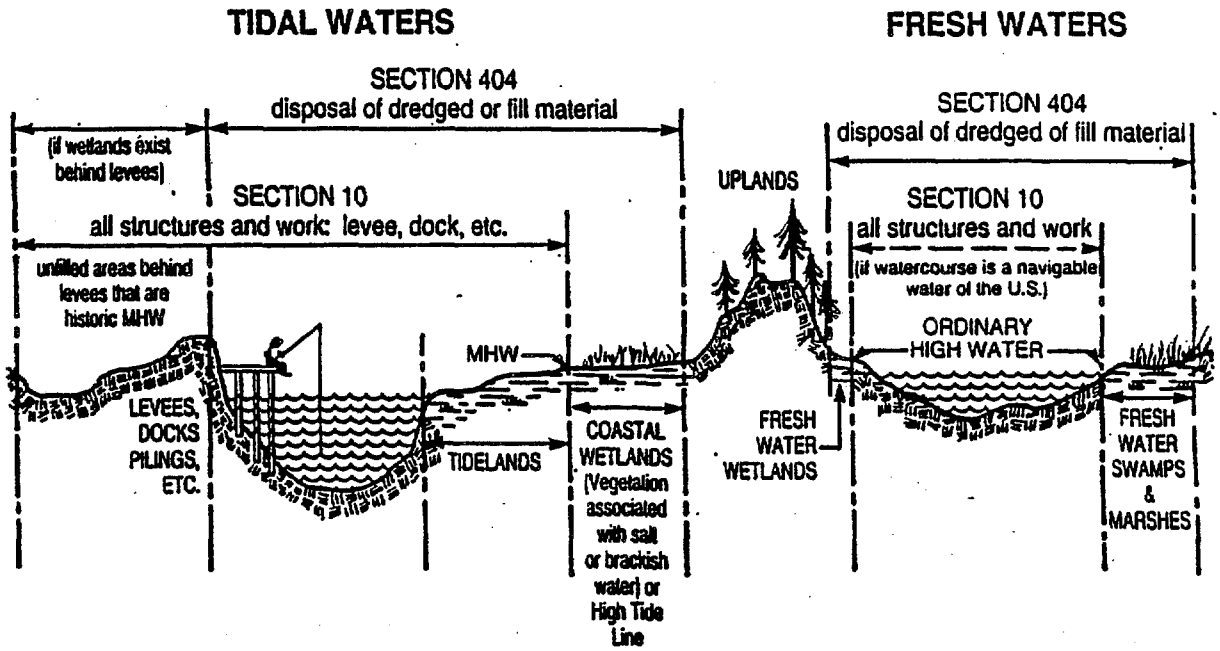
   3. *Hydrology: The area is inundated either permanently, or periodically at mean water depths < 6.6 ft. (~ 2 m), or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation. The period of inundation or soil saturation varies according to the hydrologic/soil moisture regime and occurs in both tidal and non-tidal situations*

c. *Technical approach for the identification and delineation of wetlands: Except in certain situations defined in this manual, evidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination.*

Figure 4 presents a cross-sectional diagram of the areas and habitats under ACOE jurisdiction, and under which this definition applies.

FIGURE 4

Scope of Corps Regulatory Jurisdiction



US Army Corps of Engineers
San Francisco District

NOTE:
IN ADDITION TO SECTIONS 10 AND 404 JURISDICTIONS, THE CORPS REGULATES THE TRANSPORTATION OF DREDGED MATERIAL FOR THE PURPOSE OF DISPOSING INTO OCEAN WATERS (SECTION 103).

Regulatory Functions Branch
U. S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105

Like the ACOE definition, the FWS definition (Cowardin, et al., 1979) of a wetland incorporates the three key parameters of hydrophytic vegetation, hydric soils, and hydrology:

> *Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly*[16] *hydrophytes; (2) the substrate is predominantly undrained hydric 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.*

In addition to the above definition, the FWS has developed an elaborate classification system for wetlands and deepwater habits, which was primarily created to facilitate a national inventory of wetlands (Cowardin, et al., 1979). Cowardin and his associates (1979) acknowledged the difficulty, if not impossibility, of arriving at a "single, correct, indisputable, ecologically sound definition" because of the diversity of wetland types, and because "the demarcation between wetland and dry land lay along a continuum". The FWS classification system is hierarchical, progressing from broad system descriptors to very specific modifiers for water regime, water chemistry, and soils (Cowardin, et al., 1979). Wetlands within each system share similar physical, chemical, and biological characteristics. The systems consist of the coastal wetlands which include marine and estuarine wetlands, and the interior wetlands which include riverine, lacustrine, and palustrine wetlands (Figure 5 illustrates these systems diagrammatically).

Although the FWS classification system is complex, it does provide an objective method for identifying virtually any wetland landscape. Relative to the ACOE definition, the FWS definition is generally regarded as being more inclusive in the classification and subsequent delineation of a wetland. This is because the FWS classification system defines a wetland by the presence of the proper hydrology **and either** the presence of hydric soils **or** hydrophytic vegetation, except in nonsoil areas, such as rocky intertidal areas, where only the presence of proper hydrology is required[17].

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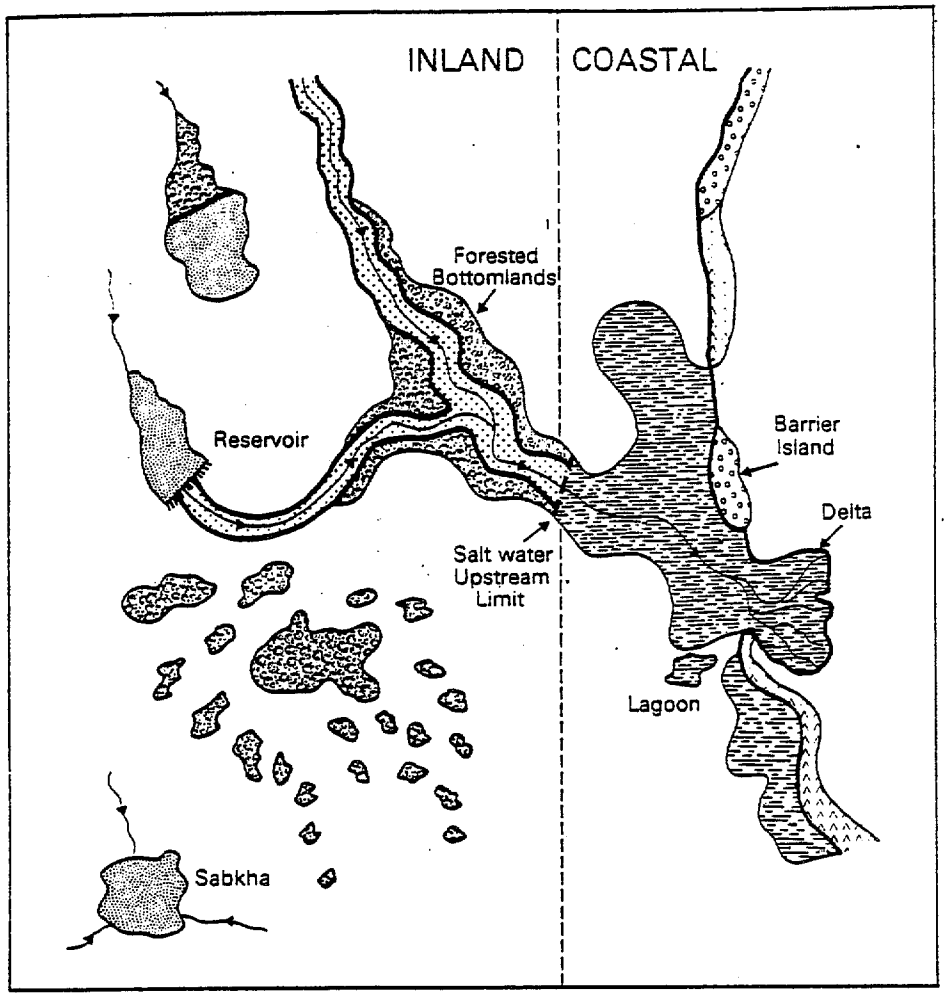
[16] Normally, a particular vegetation type (e.g., hydrophytic vegetation) is considered to predominate when it makes up at least 50% of the vegetative cover on an areal basis.

[17] A common misconception is that the FWS definition requires only one of the three requisite attributes (i.e., proper hydrology, hydrophytic vegetation, or hydric soils) be present in order for any location to qualify as a wetland. This was never the Agency's intention. For a specific discussion of this topic, the reader is referred to Tiner, R.W. Jr. 1989. *A clarification of the U.S. Fish and Wildlife Service's wetland definition*. National Wetlands Newsletter. 11(3)6–8.

FIGURE 5—Diagram Illustrating Major Wetland Systems



Systems

- Marine, Rocky
- Marine, Intertidal
- Estuarine
- Riverine
- Lacustrine
- Palustrine
- Boundaries

Source: Williams, 1991

Another federal wetland definition is found in the Food Security Act of 1985. This definition is important because it applies to agricultural lands:

> *The term "wetland", except when such term is part of the term "converted wetland", means land that has a predominance of hydric soils and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.*

The Soil Conservation Service currently assists farmers in making wetland determinations on agricultural lands. Under the "Swampbuster Provisions" of the Food Security Act (as amended in 1990), the presence of wetlands can affect the amount of federal benefits farmers receive through the federal farm benefits program. The Swampbuster Provisions allow for farm benefits to be withheld from any person who: 1) plants an agricultural commodity on a converted wetland that was converted by drainage, dredging, leveling, or any other means after December 23, 1985; or 2) converts a wetland for the purpose of or to make agricultural commodity production possible after November 28, 1990.

A recently released wetlands policy statement from the Clinton Administration charges the Soil Conservation Service with the responsibility of serving as lead agency for identifying wetlands on agricultural lands under both the Clean Water Act and the Food Security Act (Office on Environmental Policy, 1993).

All of the federal definitions use some combination of three principal attributes (i.e., hydrology, hydric soils, and hydrophytic vegetation) to determine the presence and define the boundaries of a wetland. Although a discussion of why these attributes were chosen is beyond the scope of this document, it is clear that their nation-wide use offers several advantages: 1) Each attribute is clearly defined, and the definitions are very similar if not identical among agencies; 2) the presence of each attribute, with few exceptions, is readily determined with a high degree of precision; and 3) each attribute represents a key wetland characteristic.

While it has been known for some time that several (and somewhat conflicting) wetland definitions exist at the federal level, only recently have steps been taken to address this problem. In 1993, the Clinton Administration commissioned the National Academy of Science to lead the development of a single wetland definition that will be used by all relevant federal agencies to identify wetland areas. This work will be completed in September, 1994, and should result in a more cohesive approach to wetlands regulation at the federal level.

B. Definition and Classification by California State Agencies:

In addition to the definition and classification procedures developed by federal agencies, some California resource and regulatory agencies have developed their own wetland definition and classification procedures. Although these State agency procedures are generally based on the FWS definition and classification procedure described above, they do differ in specific details.

In the California coastal zone , the California Coastal Commission (CCC), with the assistance of the Department of Fish and Game (DFG) is responsible for determining the presence of wetlands subject to regulation under the California Coastal Act. As the primary wetland consultant to the CCC, the DFG essentially relies on the FWS wetland definition and classification system, with some minor changes in classification terminology, as the methodology for wetland determinations (Radovich, 1993). However, one important difference in the DFG delineation process compared to the FWS process, is that the DFG only requires the presence of **one** attribute (e.g., hydrology, hydric soils, or hydrophytic vegetation) for an area to qualify as a wetland (Environmental Services Division, 1987).

In contrast to the detailed definition and classification system adopted by the DFG, Section 30121 of the California Coastal Act (1976), the statute governing the CCC, has an exceptionally broad definition for a wetland:

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

However, the CCC Administrative Regulations (Section 13577 (b)) provides a more explicit definition:

> *Wetlands are lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent or drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salt or other substance in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deepwater habitats.*

As discussed in chapter one, the CCC with assistance from the DFG, is responsible for determining the presence and size of a wetland subject to regulation under the Coastal Act. Although the exact procedure has varied somewhat in the past, the DFG wetland

definition and classification system is the delineation methodology generally followed by the CCC.

This discussion demonstrates that defining, delineating, and classifying wetlands are not simple matters, requiring an understanding of both wetland science and current regulatory definitions. Recently, wetland policy statements were released by both the Clinton administration and the Wilson administration, which may offer some help in this regard. Both statements identify the development of a single wetland definition as a high priority. Such a definition would need to encompass all types of wetlands and meet the needs of all relevant agencies. However, a single, clear definition for a wetland could aid in the sound management and protection of this resource, since many decisions regarding this resource are based on the definition used.

III. AGENCIES AND REGULATIONS RELATING TO WETLANDS:

Numerous federal, State, and local agencies administer and enforce a myriad of federal, State, and local regulations that pertain to the development and alteration of wetlands in the California coastal zone. Although intended to provide clear and complete oversight and protection of wetlands, the sheer number and complexity of these regulations often have the opposite result. In this section some of the more important laws and regulations affecting the development and alteration of coastal wetlands are described[18] .

A. Federal Regulatory Programs and Agencies:

Two statutes at the federal level provide the primary regulatory authority over wetlands in the United States: 1) The Clean Water Act (Section 404 (b)) regulates disposal of dredge and fill materials in waters of the United States, including all streams to their headwaters, lakes over 10 acres, and contiguous wetlands, including those above the ordinary high water mark in non-tidal waters and mean high tide in tidal waters; and 2) the River and Harbors Act of 1899 (Section 10) regulates the diking, filling, and placement of structures in navigable waterways. The ACOE is responsible for the enforcement of rules and regulations pertaining to both of these sections.

[18] This section is not a complete review of all laws and regulations pertaining to wetlands. For more information the reader is encouraged to review the following references: 1) Muir, T.A., C. Rhodes, and J.G. Gosselink. 1990. *Federal statutes and programs relating to cumulative impacts in wetlands.* Pages 223-236 in J.G. Gosselink, L.C. Lee, and T.A. Muir [Eds.]. *Ecological Processes and Cumulative Impacts: Illustrated by Bottomland Hardwood Wetland Ecosystems.* Lewis Publishers, Inc., Chelsea, MI.; and 2) Dennis, N.B. and M.L. Marcus. 1984. *Status and trends of California wetlands.* Final report prepared for the California Assembly, Resources Subcommittee.

The original intent of the River and Harbors Act was protection of waterway navigability. In 1968, however, the ACOE established a more expansive review process, "public interest review", which included assessment of local and regional interests such as land use, economics, flood control, fish and wildlife, ecology, pollution, as well as traditional navigability (Dennis and Marcus, 1984). The availability of alternatives, permanence of impacts, and cumulative effects were adopted as additional review criteria in 1974 (Dennis and Marcus, 1984). Thus, the ACOE Section 10 review process incorporates numerous criteria applicable to the regulation of wetlands occurring in navigable waterways.

Under Section 404(b) regulations, all saline, brackish, and freshwater wetlands adjacent to (and in some circumstances, isolated from) navigable waters are subject to ACOE jurisdiction. The Section 404 regulatory program has a complex judicial and administrative history, in which wetlands have become the regulatory focus of "waters of the United States". Additionally, as part of the Section 404 permit program, the EPA and the ACOE have developed guidelines (specifically 404(b)(1) guidelines) that specify disposal sites for dredged or fill material. The purpose of these guidelines is to control discharges of dredged or fill material into U.S. waters in order to restore and maintain the chemical, physical, and biological integrity of the waters. These guidelines set the criteria against which permit applications are measured.

Unfortunately, the intent and administration of the Section 404 program in interpreted in fundamentally different ways by various federal agencies. For example, the ACOE views its primary regulatory function as protecting water quality, whereas the FWS, who comments on many Section 404 permit actions, regards protecting the integrity of wetlands and their habitats as the primary function of Section 404 (Dennis and Marcus, 1984).

It is important to note that not all activities in wetlands are regulated under Section 404. For example, excavation, clearing, leveling, draining, and vegetation removal are all unregulated activities. Additionally, the ACOE's general permit system exempts the deposition of fill material in a wide variety of riparian habitats and small (≤ 1 acre) wetlands. This is particularly troublesome in California, where the seasonally dry nature of many streams and ponds precludes ACOE jurisdiction of many riparian corridors and small freshwater wetlands.

Although the River and Harbors Act and the Clean Water Act empower the ACOE with primary responsibility for the federal regulation of development and alterations in wetlands, other federal agencies are also involved. The EPA, FWS, Soil Conservation Service, and the National Marine Fisheries Service (NMFS) can review applications for ACOE Section 404 permits and provide comments and recommendations to the ACOE. In fact, under the Fish and Wildlife Coordination Act, the ACOE is required to consult with the FWS and the NMFS and give full consideration to their recommendations in

evaluating permit decisions. Additionally, under certain circumstances the EPA, FWS, and NMFS can elevate an ACOE district engineer's permit decision to the Assistant Secretary for review and reconsideration[19]. However, only the EPA has the authority (albeit, rarely used) to veto an ACOE permit decision.

Notable exceptions to this division of agency responsibility occur when threatened or endangered species are present, or when an activity is subject to the requirements of the National Environmental Policy Act. In these situations a multitude of agencies with direct regulatory authority may become involved. The lead and participating agencies will vary depending on the specific circumstances.

B. Federal-State Interaction[20]:

Pursuant to regulations adopted by the Office of Ocean and Coastal Resource Management (OCRM) under the Federal Coastal Zone Management Act (CZMA), applicants for ACOE Section 404 and Section 10 permits must include in their application a certification of consistency with the California Coastal Management Program[21]. This certification, and accompanying data and analysis, must also be submitted to the California Coastal Commission (CCC) for review and concurrence. The ACOE may not issue their permit until the CCC reviews and concurs with the applicant's consistency certification. This requirement is in addition to any other requirements the CCC has for coastal development permit applications.

Pursuant to the Fish and Wildlife Coordination Act, the ACOE must also give full consideration to comments submitted by the DFG. As the principal State resources trust agency, the DFG is obligated to comment on ACOE permit decisions in order to ensure protection of the State's natural resources. In this capacity, the DFG has drawn on the policy direction of the California Coastal Act, the California Endangered Species Act, the California Environmental Quality Act, and other relevant State laws. The DFG also consistently relies on the policy direction of California's Wetlands Conservation Policy (1993), which calls for no net loss of wetlands and a long-term net gain in the quantity, quality, and permanence of wetland acreage and values.

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[19] For a more detailed discussion of the elevation process see Davis, M.L. and R.C. Gardner. 1993. *Recognizing the Corps' commitment.* National Wetlands Newsletter. 15(2)9-10.

[20] Information in this section is from the Statewide Interpretive Guidelines (CCC, 1981).

[21] The consistency certification process must still be completed, even if the ACOE undertakes the work (e.g., maintenance dredging, or channel modification).

C. State Regulatory Programs and Agencies:

Numerous State agencies regulate, manage, or otherwise control natural resources within California through a wide variety of general and specific laws and directives, which are carried out by resource departments, commissions, and boards (Dennis and Marcus, 1984). Analyses completed in the early 1980's reviewed the effectiveness of 59 California State statutes in protecting wetlands and other water related lands, and concluded the State has limited direct authority over wetlands except in three geographic areas: the coastal zone, San Francisco Bay, and Suisun Marsh (Jones, 1981; Shute and Mihaly, 1982). Thus, although the coast is relatively well protected, inland California is not.

The California Environmental Quality Act (CEQA) sets the State's basic charter for environmental protection. Among other policies, CEQA aims to minimize or eliminate the environmental impacts from development projects. Specific wetland areas are listed as having regional or statewide significance (e.g., Suisun Marsh, Sacramento-San Joaquin Delta, and wild and scenic rivers), and the resource in general (wetlands and riparian lands) is defined as significant habitat.

The Keene-Nejedly California Wetlands Preservation Act (1976) is the only State legislation besides the Coastal Act to define wetlands (Dennis and Marcus, 1984). The act states there "is a need for an affirmative and sustained public policy and program directed at their [wetlands] preservation, restoration, and enhancement, in order that such wetlands shall continue in perpetuity". The act provided for acquisition of ten important wetlands, using funds from several sources, and was intended to support preparation of a statewide wetlands plan. However, acquisition funds were not allocated in 1976 (Dennis and Marcus, 1984).

The California Wild and Scenic rivers Act (1972) provides for the preservation of certain rivers, which possess extraordinary scenic, recreational, fishery, or wildlife values. Designated rivers are preserved in their free-flowing state, together with their immediate environments. All of the rivers currently included under this act occur in the northern half of California. Preservation under this act provides additional protection to the riparian areas adjacent to the rivers.

The Resources Agency functions as an umbrella agency for the State's resource departments, conservation boards, and commissions. The agency sets major resource policy for the State and oversees programs of member departments such as the DFG. With respect to wetlands, the Resources Agency is just beginning to implement Governor Wilson's Statewide wetlands policy. This policy defines the State's goals and objectives with regard to the preservation of remaining wetlands and set priorities and guidelines for restoration.

The State Regional Water Quality Control Boards are a regulatory body within the newly formed California Environmental Protection Agency. The regional boards' primary role is to enforce the federal Clean Water Act, and in doing so, assert regulatory authority over development activities affecting the water quality of navigable water and wetlands. Under Section 401(a)(1) of the Clean Water Act:

> *Any applicant for a Federal license or permit to conduct any activity...which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State...that any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of this Act.*

In turn, California Code of Regulations Section 3831(k) defines the State certification required under Section 401 as:

> *'Water Quality Certification' means a certification that there is a reasonable assurance that an activity which may result in a discharge to navigable waters of the United States will not violate water quality standards, where the activity requires a federal license or permit.*

Water quality standards are specified in federal regulation (40 CFR 131.6 et seq.) to include: 1) a State's numeric and narrative water quality criteria (objectives); 2) designated beneficial uses; and 3) anti-degradation policy. The anti-degradation policy requires, in part, the maintenance and protection of existing instream water uses including the level of water quality necessary to protect the existing uses. Through the Clean Water Act Section 404(b)(1) guidelines, the United States EPA interprets the anti-degradation policy to be satisfied with regards to fills in wetlands if the discharge did not result in "significant degradation" to the aquatic ecosystems.

In practice, the regional boards have applied their authority over water quality standards to all waters of the State, including wetlands. Discharge to wetlands and riparian wetlands may violate water quality objectives (e.g., turbidity, temperature, or salinity); impair beneficial uses (e.g., groundwater recharge, recreation, wildlife habitat, fish migration, and shellfish harvesting); and conflict with the anti-degradation policy.

The California Department of Fish and Game has Statewide resource responsibilities and authority that directly and indirectly influence projects and activities in coastal zone wetlands. In addition to being responsible for the maintenance and protection of California's fish and wildlife, the DFG has authorities under California's Public Resources Code, and the federal Fish and Wildlife Coordination Act to regulate or comment on activities in wetland and riparian areas. The DFG also assumes primary responsibility for implementation of the California State Endangered Species Act, and the Streambed Alteration Agreement (Fish and Game Code Sections 1601-1603). This agreement is one of the State's few direct legal instruments for the protection of

streams, rivers, and lakes. Additionally, as mentioned previously, the DFG is a primary consultant to the CCC regarding the affects of coastal development on wetlands and other natural resources. The DFG also comments directly to the ACOE concerning fish and wildlife aspects of Section 10 and Section 404 permits. DFG's official position regarding the protection of wetlands is that development projects should not result in a net loss of either wetland acreage or wetland habitat value (DFG, 1987).

The California State Coastal Conservancy (SCC) is another State agency actively involved in the protection and enhancement of coastal wetlands, although the agency has no regulatory function. The SCC was created by the legislature in 1976 to protect, restore, and enhance California's coastal resources. A primary purpose of the SCC is to resolve coastal land use conflicts not amenable to regulatory solutions, in order to protect coastal resources and expedite environmentally sound development. The SCC functions to address these conflicts with solutions unavailable to other State agencies because of their regulatory responsibilities, or because of limitations in funding, jurisdiction, or function.

The SCC accomplishes its purpose through various programs, including:

- Provision of technical assistance and guidance to nonprofit organizations
- Purchase and restoration of wetlands, sand dunes, and other important natural lands
- Revitalization of the State's urban waterfronts
- Preservation of prime agricultural lands
- Funding construction of beach access ways and trails, and retiring antiquated subdivisions within the coastal zone and San Francisco Bay

During the last 16 years, the SCC has given over $40 million to 77 nonprofit organizations to acquire and restore key wetland, open space and agricultural lands along the coast. In addition, about one-third of all SCC funds ($60 million) have gone to fund resource enhancement projects. With these fund, the SCC, in partnership with local governments and nonprofit organizations, has completed 91 resource enhancement plans, 60 wetland enhancement projects (at least one in every coastal county), and protected 24,000 acres of wildlife habitat, most of which are wetlands.

The California Coastal Commission is charged with the regulation of development in California's coastal zone as stipulated in the California Coastal Act. Sections 30230,

30231, 30233, 30236, and 30240 of the Coastal Act are directly applicable to the preservation and protection of wetlands and other environmentally sensitive areas[22].

Development[23] or alteration of California's coastal wetlands is primarily regulated by Section 30233(a) of the Coastal Act, which states:

> *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible[24] less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> *(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
>
> *(2) Maintaining existing, or restoring previously dredged depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
>
> *(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation*

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[22] Section 30107.5 of the Coastal Act defines an environmentally sensitive area as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem, and which could be easily disturbed or degraded by human activities and developments".

[23] According to Section 30106 of the Coastal Act " 'Development' means, on land, in or under water, the placement or erection of any solid material or structure; discharge or disposal of any dredged material or of any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land, including, but not limited to, subdivision pursuant to the Subdivision Map Act (commencing with Section 66410 of the Government Code), and any other division of land, including lot splits, except where the land division is brought about in connection with the purchase of such land by a public agency for public recreational use; change in the intensity of use of water, or of access thereto: construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes, kelp harvesting, and timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 (commencing with Section 4511)."

[24] Feasible is defined in Section 30108 of the Coastal Act to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors".

channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) *In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*

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

Among other things, Section 30233(a) lists the types of development for which diking, filling, or dredging may be permitted in open coastal waters, wetlands, estuaries, and lakes occurring in the coastal zone. This section also stipulates the criteria under which development is permitted (i.e., least environmentally damaging alternative and existence of feasible mitigation measures). Although permits under this section of the Coastal Act can have numerous outcomes, a review of the CCC permits relating to Section 30233 shows several clear trends (Table 2). Of the 106 permits processed Statewide between 1973 and 1986, 71 (67%) were for the deposition of fill material, 58 permits (55%) were for dredging activity, and 5 permits (5%) were for diking. (Some permits included both dredge and fill activities.) Eighty-three (78%) of the 106 permits were for new development or maintenance of existing development, while 26 (25%) were for restoration projects. Forty-nine (46%) permits included mitigation requirements. Ninety-eight (92%) of the permits were approved.

Mitigating for wetland losses is frequently required in conjunction with coastal development permits granted under Section 30233. Most commonly, these projects involve compensatory mitigation. Both in-kind mitigation and <u>out-of-kind mitigation</u> are used. Coastal Act Section 30607.1 contains some of the most explicit language regarding mitigation for wetland development projects, and states in part:

Table 2

SUMMARY OF CALIFORNIA COASTAL COMMISSION PERMIT ACTIVITY RELATING TO SECTION 30233, 1973–1986[25]

Year	Total Number of Permits	Number of Permits for Dredging	Number of Permits for Diking	Number of Permits for Fill	Number of Permits Approved	Number of Permits Denied	Number of Devel. or Maint. Proj.	Number of Restoration Projects	Number Requiring Mitigation
1973	2	0	0	2 (100%)	1 (50%)[26]	1 (50%)	2 (100%)	0	0
1974	3	2 (66%)	0	1 (33%)	3 (100%)	0	3 (100%)	0	0
1975	2	0	0	2 (100%)	2 (100%)	0	2 (100%)	0	1 (50%)
1976	4	3 (75%)	1 (25%)	1 (25%)	3 (75%)	1 (25%)	4 (100%)	0	0
1977	5	2 (40%)	0	5 (100%)	5 (100%)	0	4 (80%)	1 (20%)	1 (20%)
1978	7	1 (14%)	0	6 (86%)	5 (71%)	2 (29%)	7 (100%)	0	5 (71%)
1979	8	6 (75%)	0	5 (63%)	8 (100%)	0	6 (75%)	3 (38%)	1 (13%)
1980	10	5 (50%)	0	7 (70%)	10 (100%)	0	8(80%)	4 (40%)	8 (80%)
1981	7	6 (86%)	0	2 (29%)	6 (86%)	1 (14%)	4 (57%)	3(29%)	1 (14%)
1982	18	7 (39%)	1 (6%)	12 (67%)	17 (94%)	1 (6%)	15 (83%)	3 (17%)	10 (56%)
1983	18	12 (67%)	2 (11%)	14 (78%)	16 (89%)	2 (11%)	12 (67%)	6 (33%)	6 (33%)
1984	11	8 (73%)	1 (9%)	7 (64%)	11 (100%)	0	8 (73%)	3 (27%)	7 (64%)
1985	5	2 (40%)	0	3 (60%)	5 (100%)	0	3 (60%)	2 (40%)	3 (60%)
1986	6	4 (66%)	0	4 (66%)	6 (100%)	0	5 (83%)	1 (17%)	6 (100%)
1973–1986	**106**	**58 (55%)**	**5 (5%)**	**71 (67%)**	**98 (92%)**	**8 (8%)**	**83 (78%)**	**26 (25%)**	**49 (46%)**

25 Based on information contained in: CCC 1988. Draft Wetlands Task Force Report, Appendix C.

26 Percentages are calculated as the proportion of the total number of permits occurring in a specific category.

Where any dike and fill development is permitted in wetlands in conformity with Section 30233 or other applicable policies set forth in this division, mitigation measures shall include, at a minimum, either acquisition of equivalent areas of equal or greater biological productivity or opening up equivalent areas to tidal action; provided, however, that if no appropriate restoration site is available, an in-lieu fee sufficient to provide an area of equivalent productive value or surface areas shall be dedicated to an appropriate public agency or the replacement site shall be purchased before the dike or fill development may proceed...

One interpretation suggests Section 30607.1 sanctions acquisition of an existing wetland as acceptable mitigation for an allowable wetland development project. However, such an approach would lead to a net loss of wetland area. In practice, the CCC has interpreted the phrase "at a minimum" to require inclusion of a restoration component in any acquisition plan in order to avoid the net loss of wetland area.

The CCC works with the applicant to develop specific mitigation requirements with the help of DFG, Coastal Conservancy, FWS, EPA, NMFS, and ACOE staff. Determining the amount and type of mitigation required is a contentious and complex matter often confounded by both a lack of applicable technical information and the regulatory process. Although numerous mitigation projects have been approved by the CCC, there is little information describing the success of these projects. This is a serious and chronic problem attributable to a lack of specific performance standards necessary to gauge the success of mitigation projects, and a lack of technical information and/or resources needed to evaluate these projects.

Probably one of the more contentious issues under Section 30233 is the stringent review of projects proposed in "degraded wetlands" (Section 30233(a.3)). With respect to historic wetland losses along the southern California coast, one intent of the Coastal Act is to halt the loss of wetlands and, where feasible, restore the resource (Dennis and Marcus, 1984). The main points of contention usually focus on the wetland delineation and the determination of what constitutes "degraded condition".

Section 30411 establishes the DFG as the lead agency charged with the study and identification of degraded wetlands, and provides general guidelines for classifying a wetland as degraded. However, the ecological complexity of wetlands and the lack of a single definition limits the degree of certainty with which these determinations can be made. The DFG has described its process for determining if a wetland is in fact degraded (for example see, DFG, 1981). In essence, the DFG makes this determination through an examination of the subject area to determine if the system has been adversely impacted by previous alterations, resulting in a degraded condition when compared to remaining unaltered areas or historic information. In addition, Coastal Act Section 30411(b) states that any such study of a wetland shall include consideration of all of the following:

(1) *Amount and elevation of filled areas.*

(2) *Number and location of dikes and other artificial impediments to tidal action and freshwater flow and the ease of removing them to allow tidal action to resume.*

(3) *Degree of topographic alterations to the wetland and associated areas.*

(4) *Water quality.*

(5) *Substrate quality.*

(6) *Degree of encroachment from adjacent urban land uses.*

(7) *Comparison of historical environmental conditions with current conditions, including changes in both the physical and biological environment.*

(8) *Consideration of current altered wetland conditions and their current contribution to coastal wetland wildlife resources with relation to potential restoration measures.*

(9) *Chemical cycling capabilities of the wetland including water quality enhancement, nutrient accumulation, nutrient recycling, etc.*

As part of this identification process, the extent of any wetland on the site must be identified with precision (CCC, 1981).

Section 30233(c) of the Coastal Act further limits development and alteration of wetlands throughout the coastal zone, stating:

> *In addition to the other provisions of this Section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19[27] coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.*
>
> *For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that not less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay, shall be designed and used for commercial fishing activities.*

[27] See the Statewide Interpretive Guidelines (CCC, 1981) For a complete list of these 19 wetlands.

Numerous coastal wetlands (e.g., riparian areas) are considered environmentally sensitive habitat areas because they provide critical habitat to threatened or endangered species, or because of their uniqueness relative to the surrounding landscape. Thus, Section 30240 provides additional regulatory oversight of wetlands in certain situations. Section 30240 states:

a) *Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*

b) *Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat recreation areas.*

Ports and port-related develop also have the potential of affecting coastal wetlands[28]. Development within those portions of Ports Hueneme, Long Beach, Los Angeles, and San Diego Unified Port District lying within the coastal zone is generally governed by the provisions contained in Chapter 8 of the Coastal Act. However, wetlands and estuaries that have been identified on the CCC's Port Jurisdiction Maps (adopted by the Commission on April 6, 1977 pursuant to Section 30710) are not governed by the provisions of Chapter 8, but instead are subject to Chapter 3 policies of the Coastal Act (Coastal Act Section 30700).

Chapter 8 provisions apply to all "water areas" (a termed used only in this chapter) regardless of whether such area is considered wetland, estuary, or open coastal water. The diking, filling, or dredging of any water area within the defined areas of these ports is limited by Section 30705, 30706, and 30708 of the Coastal Act. The diking, filling or dredging of any wetland or estuary occurring in any port, harbor district or authority not named in Chapter 8 (e.g., Humbolt Bay Harbor, Recreation and Conservation Districts, or Moss Landing Harbor District) is subject to Chapter 3 provisions of the Coastal Act.

Section 30236 of the Coastal Act regulates development in aquatic regions such as rivers and streams. These sections address specific types of development such as channel alteration, dams, and flood control projects, which could impact riparian areas or tidal marshlands.

Finally, the CCC has adopted the *Statewide Interpretive Guidelines for Wetlands and Other Wet Environmentally Sensitive Habitat Areas* (CCC, 1981; Appendix A). These guidelines

[28] Information relating to ports and port activities is taken from Section IV(E) of the Statewide Interpretive Guidelines (CCC, 1981).

were developed to assist the CCC, local government, and the public in the application of the Coastal Act and certification of local coastal plans. These guidelines contain technical definitions for wetlands and riparian areas, discuss conditions for permitting development in these areas, and provide information pertaining to the maintenance and restoration of wetlands.

D. Local Government Regulatory Programs and Agencies:

The California Coastal Act is designed to delegate local governments with much of the CCC's authority over control of coastal development. Section 30004(a) of the Coastal Act states:

> *To achieve maximum responsiveness to local conditions, accountability, and public accessibility, it is necessary to rely heavily on local government and local land use planning procedures and enforcement.*

To meet the objectives of Section 30004(a), the Coastal Act directs each of the 73 cities and counties lying wholly or partly within the coastal zone to prepare a Local Coastal Plan (LCP) for CCC review and certification[29]. With a certified LCP, each local government assumes authority for permitting certain types of development in specified areas of the coastal zone. It is important to note, however, that even after LCP certification, the CCC continues to have a major role in regulating wetland development. Specifically, Coastal Act Section 30519(b) states in part:

> *Subdivision (a)* [that is, delegation of development review authority to a local government] *shall not apply to any development proposed or undertaken on any tidelands, submerged lands, or on public trust lands, whether filled or unfilled, lying within the coastal zone,...*

Thus, the CCC retains regulatory authority over virtually all of the wetlands in the coastal zone either through its original jurisdiction, or through the appeal process[30].

LCP's provide for the regulation of wetland development in one of two principal ways: 1) through the adoption of Coastal Act Section 30233 (with or without some modification); or 2) by identifying wetlands as environmentally sensitive areas and then

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[29] The Coastal Act allows local governments, with CCC approval, to divide their coastal zone into geographic segments, and to prepare a separate LCP for each segment. For this reason, there are currently 126 LCP segments, instead of 73 (the actual number of coastal zone cities and counties). To date, 80 total LCP segments (64 percent) have been effectively certified and the relevant local governments are now issuing coastal development permits.

[30] With regard to projects affecting wetlands, Coastal Act Section 30603(a)(2) limits the appeal of an action taken by a local government on a coastal development permit application to "developments... that are located within 100 feet of any wetland, estuary, or stream..."

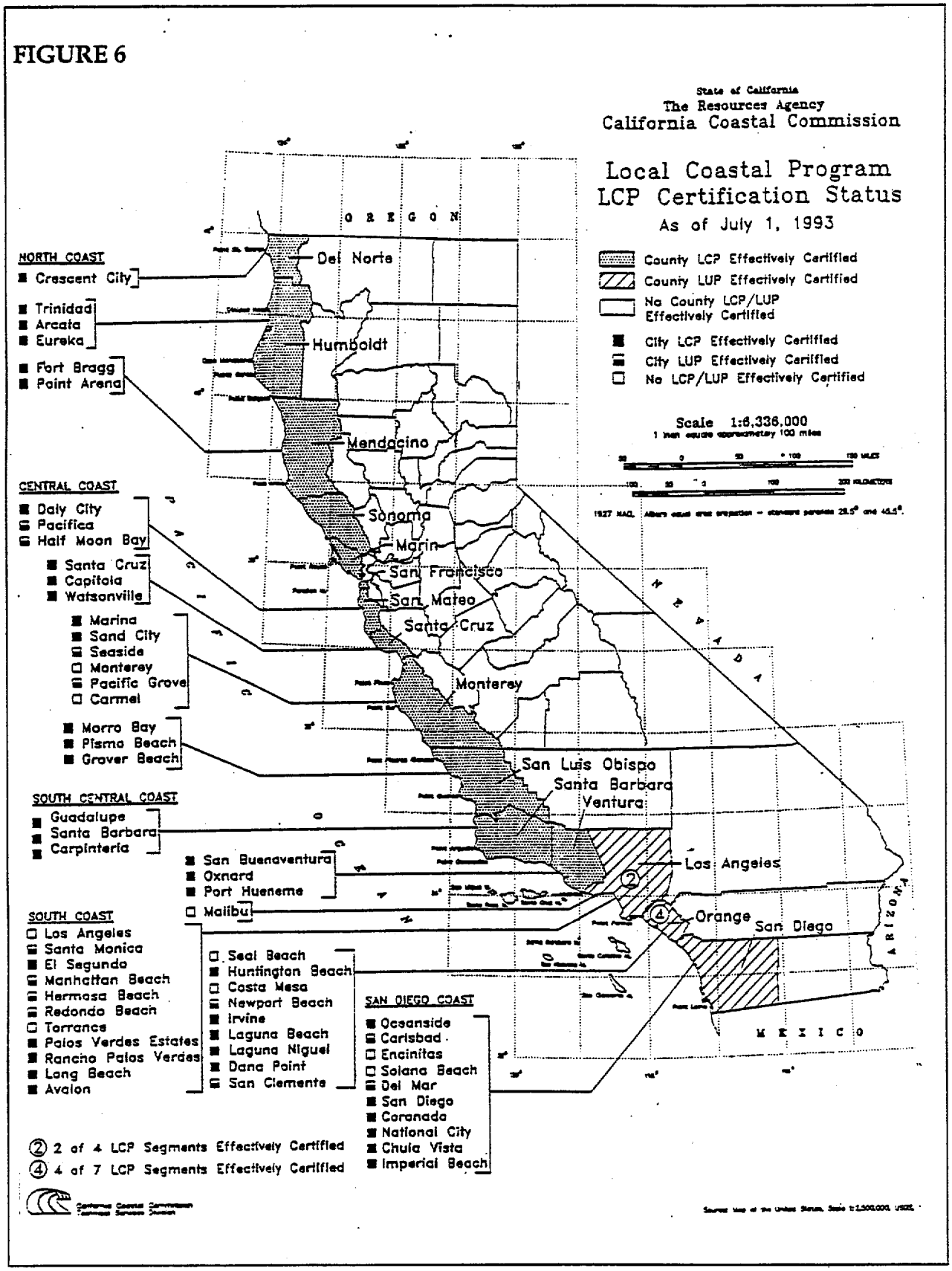
adopting Coastal Act Section 30240 (with or without some modification). Of the 67 LCP's with policies regulating development in wetlands, 37 (55 percent) use Section 30233 and 27 (40 percent) use Section 30240. The remaining three LCP's (5 percent) regulate wetland development through the creation of new policies.

The way in which LCP's regulate wetland development is somewhat influenced by the distribution of wetlands throughout the California coastal zone. Wetlands are relatively more numerous and diverse in the northern half of the State (North Coast and Central Coast regions, Figure 6); thus, the overall approach to wetland regulation is somewhat more dependent on development activity. LCP's from these regions contain policies that generally regulate development in wetlands and are applied as wetland development projects occur. In contrast, wetlands are relatively scarce in the southern half of the State (South Central Coast, South Coast, and San Diego Coast, Figure 6), and so each one is considered vitally important. Thus, many of the LCP's specifically identify the wetlands within the respective jurisdiction and contain specific regulations for development.

Some general trends in the type of wetlands regulated also exist among the LCP's. All of the LCP's contain some discussion of wetlands ranging from a single statement that wetlands do not occur within the jurisdiction, to an elaborate discussion of the types and characteristics of the wetlands found within the jurisdiction. Overall, riparian areas were most often included as a specific type of wetland, with 41 (61%) of the 67 LCP's identifying this habitat as a type of wetland. Additionally, it was not uncommon for the LCP's to identify specific areas (mainly river and stream corridors) as riparian areas.

Of the 80 LCP's effectively certified Statewide, only 13 (16%) have no policies explicitly limiting development in wetlands. In all cases, this is because wetlands were known not to occur, or have not been identified within the jurisdictional boundaries. Of these 13 LCP's, two occur in the north coast region, one occurs in the central coast region, two occur in the south central coast region, seven occur in the south coast region, and one occurs in the San Diego coast region (Figure 6).

FIGURE 6


State of California
The Resources Agency
California Coastal Commission
Local Coastal Program
LCP Certification Status
As of July 1, 1993
County LCP Effectively Certified
County LUP Effectively Certified
No County LCP/LUP Effectively Certified
City LCP Effectively Certified
City LUP Effectively Certified
No LCP/LUP Effectively Certified
Scale 1:6,336,000
OREGON
NEVADA
ARIZONA
MEXICO
Del Norte
Humboldt
Mendocino
Sonoma
Marin
San Francisco
San Mateo
Santa Cruz
Monterey
San Luis Obispo
Santa Barbara
Ventura
Los Angeles
Orange
San Diego
NORTH COAST
Crescent City
Trinidad
Arcata
Eureka
Fort Bragg
Point Arena
CENTRAL COAST
Daly City
Pacifica
Half Moon Bay
Santa Cruz
Capitola
Watsonville
Marina
Sand City
Seaside
Monterey
Pacific Grove
Carmel
Morro Bay
Pismo Beach
Grover Beach
SOUTH CENTRAL COAST
Guadalupe
Santa Barbara
Carpinteria
San Buenaventura
Oxnard
Port Hueneme
Malibu
SOUTH COAST
Los Angeles
Santa Monica
El Segundo
Manhattan Beach
Hermosa Beach
Redondo Beach
Torrance
Palos Verdes Estates
Rancho Palos Verdes
Long Beach
Avalon
Seal Beach
Huntington Beach
Costa Mesa
Newport Beach
Irvine
Laguna Beach
Laguna Niguel
Dana Point
San Clemente
SAN DIEGO COAST
Oceanside
Carlsbad
Encinitas
Solana Beach
Del Mar
San Diego
Coronado
National City
Chula Vista
Imperial Beach
2 2 of 4 LCP Segments Effectively Certified
4 4 of 7 LCP Segments Effectively Certified

IV. EXISTING MANAGEMENT PRACTICES:

A. Management of Federal Lands in California:

Approximately 45% of California's land (46.5 million acres) is managed by federal agencies (Dennis and Marcus, 1984). The majority of these lands are managed by the Forest Service (46%, 21. 4 million acres) and the Bureau of Land Management (37%, 17.2 million acres), but the defense departments also manage substantial acreage, many containing small but significant wetlands. In addition, the National Park Service manages park lands, and the FWS maintains National Wildlife Refuges. Both of these lands can contain substantial wetland areas.

The federal government's management and control of California's wetlands is substantial, given the significant amount of land under federal ownership. Federal lands are used for the extraction and production of minerals, oil, gas, and timber, and for grazing, industrial activities, living quarters, military training, water storage, parks, and wilderness areas. Various statutes, orders, and regulations such as President Bush's Wetlands Protection Executive Order (E.O. 11990), the National Environmental Policy Act, the Federal Land and Management Act, and the Forest Management Act give some assurance that sensitive resources, such as wetlands, occurring on federal lands will receive appropriate protection. However, the federal land management agencies can exercise considerable discretion in their management practices, since the statutes and other rules provide little specific guidance (Dennis and Marcus, 1984). Outside scrutiny by private interest groups, local government, and State resource agencies provide another check of federal activities.

B. Management of State Owned Lands in California:

Approximately two percent (1.95 million acres) of California's land is in State ownership (Fay, et al., 1990). Nearly 66 percent of the State owned lands are administered by the California Department of Parks (Fay, et al., 1990), but other State agencies such as the Department of Fish and Game, the Department of Forestry, the Coastal Conservancy, and State universities and colleges hold title to lands with substantial wetlands. Overall, the State's land holdings are significantly smaller than those of the federal government, but the vast majority of the State lands are owned by agencies focusing on conservation and preservation. The California Environmental Quality Act governs the State's development activities on its lands. Additionally, State owned lands in the coastal zone are subject to regulation under the Coastal Act.

The State of California also owns nearly 4 million acres of sovereign lands. These lands underlie the State's navigable and tidal waterways and include the beds of:

1) hundreds of tidal and non-tidal rivers, streams, and sloughs; 2) nearly 100 non-tidal navigable lakes; 3) the tidal navigable bays and lagoons; and 4) intertidal and subtidal lands adjacent to the entire coast and offshore islands of the State from the mean high tide line to three miles offshore. Thus, many of these State-owned sovereign lands are adjacent to or include wetland areas. Depending on their location, sovereign lands are managed by the California State Lands Commission and other State and local agencies as public trust resources.

C. Management of Individual Wetlands:

Numerous individual wetlands within California are managed by various public agencies as a way to ensure their preservation. Such "managed wetlands" often include both modified and unmodified areas, and range in size from tens to thousands of acres. Two examples of such wetlands in the California coastal zone are the National Estuarine Research Reserves of Elkhorn Slough and the Tijuana River Estuary.

The overall goal of these management activities is to preserve, restore, and enhance one or more of the functions and values attributable to wetlands. Such functions and values include retention of flood waters, detoxification of receiving waters, recreation, research, and provision of critical habitat. Typically, a management plan[31] serves to guide the direction and implementation of the activities essential for obtaining the overall goal.

D. Wetland Management Goals and Concerns:

The primary goal of resource and regulatory agencies is to preserve the remaining wetland acreage (i.e., maintain a 'no net loss policy'). A secondary, but equally important goal is to restore lost and disturbed wetland landscapes. Thus, in addition to the preservation and protection of existing coastal wetlands, resource and regulatory agencies must strive to increase total wetland acreage through restoration, and improve the chemical, physical, and biological quality of degraded wetlands.

Although these goals are easily stated, they are not easily achieved. The high population densities in the California coastal zone, particularly along the south coast and San Francisco Bay, continue to exert pressure for further urban and industrial development in wetland areas. Meanwhile agricultural activities (historically the leading cause of wetland loss in California) continue with limited regulation. Changes

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[31] Management plans vary greatly in both format and content; however, a useful guide for the development of wetland management plans has been produced by the Lane Council of Governments (1992). *Hints on Preparing a Comprehensive Wetland Management Plan.* Pages 21-29 in The Association of State Wetland Managers. *Background Report Symposium Wetlands and Watershed (Water Resources) Management.* May 10-12, 1993. Sparks, Nevada.

in permitting procedures have also yielded results counter to the no net loss policy. For example, ACOE Nationwide Permit Number 26 (NWP 26) authorizes the discharge of dredge or fill material into headwaters and isolated waters of the United States in certain situations. Projects seeking authorization under NWP 26 receive considerably less scrutiny and evaluation through the associated ACOE process. An analysis of ACOE permits granted in California between 1987 and 1992 found that 775 projects were authorized under NWP 26, resulting in a loss of at least 725 acres of wetlands in the northern two-thirds of the State (Long, et al., 1992). Clearly, NWP 26 permitting is having a negative impact on wetlands in California.

Thus, the inevitable conflicts between preservation goals for environmental resources and development activities present a major challenge to resource and regulatory agencies. Other important considerations include the multitude of agencies involved in wetlands regulation and the conflicting and confusing definitions and classification procedures. These process concerns combined with the paucity of substantive technical information are critical management concerns.

V. SUMMARY:

The regulations, policies, and processes guiding the management and protection of California's coastal wetlands are numerous, and complex. Although specific regulations controlling development in wetlands exist at all levels of government, there is evidence to suggest the goal of no-net-loss of wetlands has not been achieved. The ability to protect existing wetlands is also hampered by inconsistencies among regulatory agencies and gaps in existing regulations. The lack of a single, clear, and broadly instituted definition for a wetland is a major inconsistency among regulatory agencies, which can act to compound regulatory problems. Meanwhile, certain types of wetlands, such as riparian areas and seasonal wetlands, do not receive equal protection at all levels of government because of differences in adopted definitions, agency imposed limitations of adopted definitions, and jurisdictional limitations. Additionally, several activities resulting in the loss of wetlands such as draining, vegetation removal, and agriculture are not regulated to the same degree as dredging, filling, and diking.

Of the wetland development projects that are permitted, many involve some form of mitigation. Although mitigation can be a viable alternative, establishment of the specific requirements is generally on a case-by-case basis and often involves a complex and time intensive process. This approach is incompatible with attempts by regulatory agencies to implement consistent mitigation policies and requirements.

In many cases the level of protection a wetland receives is a function of both ownership and land use. Although much of California is held in public (i.e., federal, State, or local government) ownership, many wetlands of significant size are under private

ownership. The level of wetland protection can be lower on private lands, although public ownership does not necessarily guarantee appropriate protection. Meanwhile, land use patterns can have direct and indirect affects on wetlands: urban and agricultural development in a wetland are obvious direct affects, while development outside the wetland but within the same watershed can indirectly affect wetlands through alteration of physical and chemical processes. On a larger scale, regional, Statewide, and (in the case of Canada) international land use patterns can affect coastal wetlands through, for example, changes in air quality, hydrology, and the abundance of birds and fish.

It is clear that the management and protection of wetland resources involves numerous complex issues. Although we have come a long way in our knowledge and protection of California's coastal wetland resources, much work still remains.

CHAPTER FOUR

PRIORITY WETLAND RESOURCE CONCERNS: A REVIEW OF RELEVANT TECHNICAL INFORMATION

I. INTRODUCTION:

Wetlands are a significant natural resource within the United States. Only since the late 1960's, however, have wetlands engaged the attention of individuals from a range of disciplines who endeavor to understand their variety and complexity (Williams, 1991). Recent but intense interest in wetlands is due largely to their nature and our changing perceptions of them. We have come to understand how important wetlands are to the existence of numerous plants and animals, as well as the many functions they perform that are important to our quality of life and very existence. Indeed, the scarcity, complexity, and intrinsic value of wetlands has engendered substantial concern and sustained interest.

This chapter presents a review of scientific and technical information relevant to understanding the priority wetland resource concerns for California. Three features of wetlands are discussed: 1) ecology; 2) functions and values; and (3) sources of impacts. A basic understanding of each feature is essential for the intelligent management of this valuable resource. This chapter focuses on those types of wetlands occurring in the California coastal zone. It is not intended to present an exhaustive review, but rather to give the reader a basic level of understanding and a sense of the information available. The subjects covered here are complex and the information base is rapidly expanding. The reader is encouraged to consult the referenced literature for additional information.

II. THE ECOLOGY OF WETLANDS IN BRIEF:

Wetlands are a transitional landscape occurring within a continuum that begins in aquatic habitats and ends in dry upland habitats. Because of their intermediate location, wetlands contain characteristics of both aquatic and terrestrial environments: they are an ecotone. Thus, a variety of physicochemical processes such as topography, hydrology, sediment dynamics, and water chemistry interact to form the environment that largely determines the flora and fauna found within a wetland. Additionally, biological interactions continually act to further shape the wetland community. In this section some of the major physical (topography and hydrology), chemical (water

quality), and biological components affecting the ecology of California's coastal wetlands are described.

A. Topography:

On a geological time scale California's coastal wetlands are relatively recent landscape features resulting from the complex interaction of geological processes and changes in sea level (Bloom, 1983a,b). These geological processes, driven by plate tectonics, resulted in a coastline characterized by a sharp, steeply inclined coast of uplifted marine terraces into which narrow river valleys were cut during the Pleistocene glacial epoch (Bloom, 1983a,b). Coastal wetlands were created during the last 15,000 years when the rapid rise in sea level and the end of the last ice age inundated coastal river valleys resulting in the formation of bays, estuaries, lagoons, and salt marshes[32] (Bloom, 1983a,b; Orme, 1991). As a result, the majority of California's coastal wetlands are geographically isolated landscape features and relatively small when compared to the extensive wetlands present in other parts of the United States (NOAA, 1990).

California, however, does have the most extensive wetlands of any west coast state excluding Alaska (NOAA, 1990). Its 110 major coastal wetlands (see Figure 7) represent a diversity of habitat types, ranging from the generally undeveloped estuaries and marshes that border tidal-flushed river mouths in the north, to the highly urbanized saline lagoons, embayments, and salt marshes in the south. This diversity of wetlands is principally due to California's position at the edge of a dynamic continental land mass, where sea level and land elevation are in flux.

Coastal wetlands in the northern region of the State (Del Norte and Humboldt counties) are of four general types: 1) riparian areas surrounding rivers, streams, and other water bodies; 2) relatively isolated fresh- and brackish-water lagoons; 3) estuarine river mouths; and 4) protected bays or coves with little estuarine area. Wetlands in this region have been subjected to relatively little human development, which can have significant impacts on the topography of this landscape.

Some of the State's largest wetlands occur in the central region of California, which extends from Cape Mendocino to Point Conception. Excluding the San Francisco

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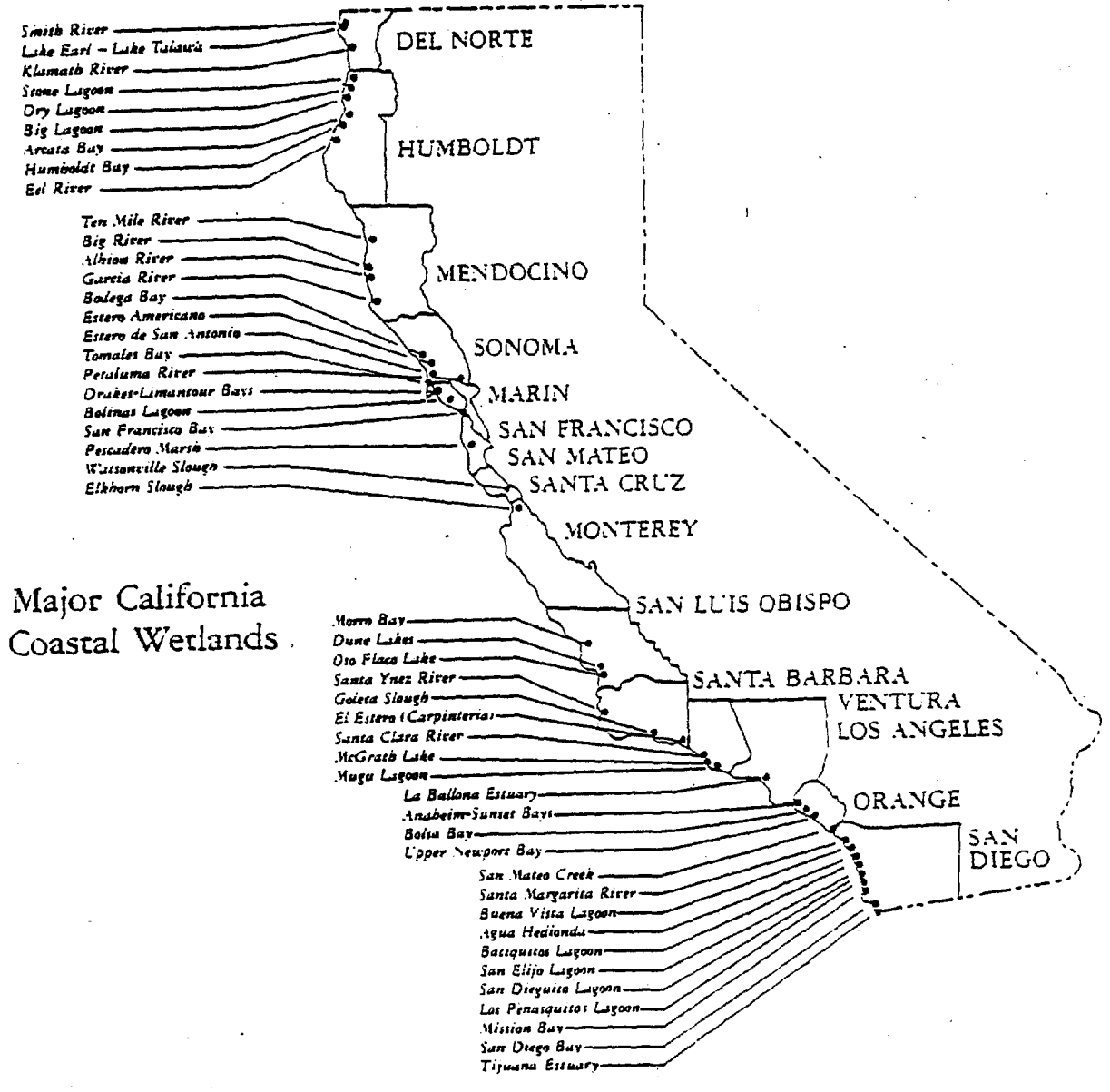
[32] For a more detailed discussion of the historical processes that formed California's coastal wetlands, the reader is encouraged to review: Josselyn, M. 1983. *The ecology of San Francisco Bay tidal marshes: a community profile.* U.S. Fish and Wildlife Service, Division of Biological Services, Washington, D.C. FWS/OBS-83/23. 102 pp.; and Zedler, J.B., C.S. Nordby, and B.E. Kus. 1992. *The ecology of the Tijuana Estuary, California: a national estuarine research reserve.* NOAA Office of Coastal Resource Management, Sanctuaries and Reserves Division, Washington D.C.; and references cited within.

FIGURE 7—Map of Major California Coastal Wetlands



Source: Dennis & Marcus, 1984.

Estuary, many of the wetlands in this region have been subjected to limited human disturbance (with some notable exceptions). Numerous small coastal wetlands, usually at the terminus of coastal streams exist in this region. Freshwater lakes also exist in the coastal zone of several central California counties. Mendocino County contains California's only coastal fen, a relict of the ice age. Vernal pools exist in the coastal terraces of Monterey, San Luis Obispo and Santa Barbara Counties.

The San Francisco Estuary, which includes the San Francisco Bay, the Suisun Marsh, and the Sacramento-San Joaquin Delta, is the largest estuary on the west coast of North and South America (Meiorin, et. al., 1991). Wetlands and related habitats comprise some of the most valuable natural resources of this estuary, but also some of the most adversely affected natural resources. A recent comprehensive study found that only 19% (≈44,400 acres) of the original tidal marshes remain in this estuary (Meiorin, et. al., 1991)[33].

At one time, extensive wetland areas occurred in Southern California (Point Conception to Mexico), but only 25% of the total (≈13,100 acres) is thought to remain (Septh, 1969a,b). The remaining wetlands are relatively small and discrete, confined by narrow river valleys, and separated by coastal hills and mountains (Zedler, 1982) (Figure 8). Most commonly, wetlands in this region occur along the fringe of bays, as lagoons, river mouth marshes, and salt marshes. Generally, the marshes occur on intertidal slopes or the tops of creek banks that quickly grade from mean sea level to extreme high water (Zedler, 1982). Many of the wetlands in Southern California exist under very disturbed conditions often surrounded by extensive urban development (Zedler, 1982). The primary value of southern California's coastal wetlands is habitat and its role in maintaining biodiversity (Zedler, 1991)

For California then, large scale evolutionary processes have acted to produce a highly variable coastal zone with numerous relatively isolated and unique wetland landscapes. Humans have also significantly impacted these wetlands resulting in further alterations of the topography as well as the overall ecology.

B. Hydrology:

The hydrology of coastal wetlands is made complex by their location at the interface between terrestrial and marine environments (Orme, 1991). Tides, waves, currents, river discharge, and ground-water seepage are all important, but temporally and spatially variable components of coastal wetland hydrology (Orme, 1991). Yet even

[33] The reader is encouraged to review the cited literature for additional information on the San Francisco Estuary.

salinity, water salinity has a direct affect on the distribution and abundance of wetland vegetation (Mall, 1969). In southern California where hypersaline soils occur, wetland flora is limited and highly stressed: up to 17 species of halophytes (mostly succulents) are common, and all respond to decreased salinity by becoming taller and more dense (Zedler, 1982). Patterns in primary productivity also show strong correlation with soil salinity (Zedler, 1982). Although the suite of plant species differs among California's coastal wetlands, there is little doubt that salinity is a major limiting factor to vascular plant growth (Josselyn, 1983; Zedler, 1982).

Water turbidity is another water quality constituent that directly affects wetland ecology. Turbidity is caused by the suspension of inorganic sediments and particulate organic matter (POM) derived from sources inside (autochthonous) or outside (allochthonous) the wetland. Autochthonous materials are generated biogenically or chemically, originating either from the accumulation of plant and animal detritus or from the *in situ* precipitation of evaporate deposits from brines (Orme, 1991). In coastal wetlands, tide and wind resuspension of accumulated sediments are also major causes of turbidity (Orme, 1991) Allochthonous materials arrive via wind, or in suspension with freshwater inflows and tidal waters (Orme, 1991). In California, freshwater inflows can be a major source of suspended material, but are spatially and temporally variable because of the geographical and seasonal variability in precipitation.

Although turbidity directly affects both wetland plants and animals, the impact is mainly confined to the subtidal portion of wetlands. For plants, turbidity affects light penetration, and thus is one factor controlling the lower limit of plant establishment and overall production (Josselyn, 1983). In the intertidal zone, however, turbidity is probably not limiting to plant establishment and growth because these areas are exposed a portion of each day. In the intertidal zone, other factors such as plant shading, desiccation, and temperature increase in importance (Zedler, et al., 1992). For animals, turbidity impacts the effectiveness of visual predators, such as birds and mammals, and the feeding ability of benthic filter feeding organisms (Dickert, et al., 1978; Josselyn, 1983; Nichols and Pamatmat, 1988). Overall, turbidity has limited but important impacts on the distribution of plants and the foraging of some animals.

Nutrients are also water quality constituents of critical importance to the existence of wetland organisms. Nutrients are continually required by all living organisms for growth and reproduction. Although a variety of nutrients are required by plants and animals, most studies focus on the availability of inorganic nitrogen because this constituent is considered most limiting to plants[34]. Plants, in turn, are the major source of nutrients for animals.

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[34] More recently, this view has been challenged. For more information see Smith, S.V. 1984. *Phosphorus versus nitrogen limitation in the marine environment.* Limnol. Oceanogr. 29:1149–1159; and Howarth, R.W. and J.C. Cole. 1985. *Molybdenum availability, nitrogen limitation, and phytoplankton growth in natural waters.* Science 229:653–655.

As with turbidity, both allochthonous and autochthonous sources of nutrients are available to wetland organisms. The wetland landscape is an open system with an ongoing exchange of materials among deepwater habitats, uplands, and the atmosphere. The majority of California's coastal wetlands have connections with both the ocean and one or more sources of freshwater. Allochthonous nutrient sources include freshwater inflows and tidal flows, while autochthonous sources include nitrogen fixation, remineraliztion, and animal excretions (Nixon, 1980).

Nutrient dynamics within wetlands are very complex. Both nutrient availability and requirements vary through time and space. Thus, few accurate generalizations regarding nutrient patterns exist. It does appear that coastal wetlands vary in their needs for nitrogen. For example, results from Winfield's (1980) study of the Tijuana Estuary indicate that while both nitrate and nitrite were exported from the estuary in small amounts, overall there was a net import of inorganic nitrogen. Ammonium was usually the most prevalent form of inorganic nitrogen found during the study, with higher concentrations measured on a seasonal basis during the winter and spring, and on a daily basis during flood tide. Thus, while it is clear that nutrients are important to wetlands, much more information is needed (particularly for California's coastal wetlands) before we fully understand the dynamic processes of nutrient sources and sinks.

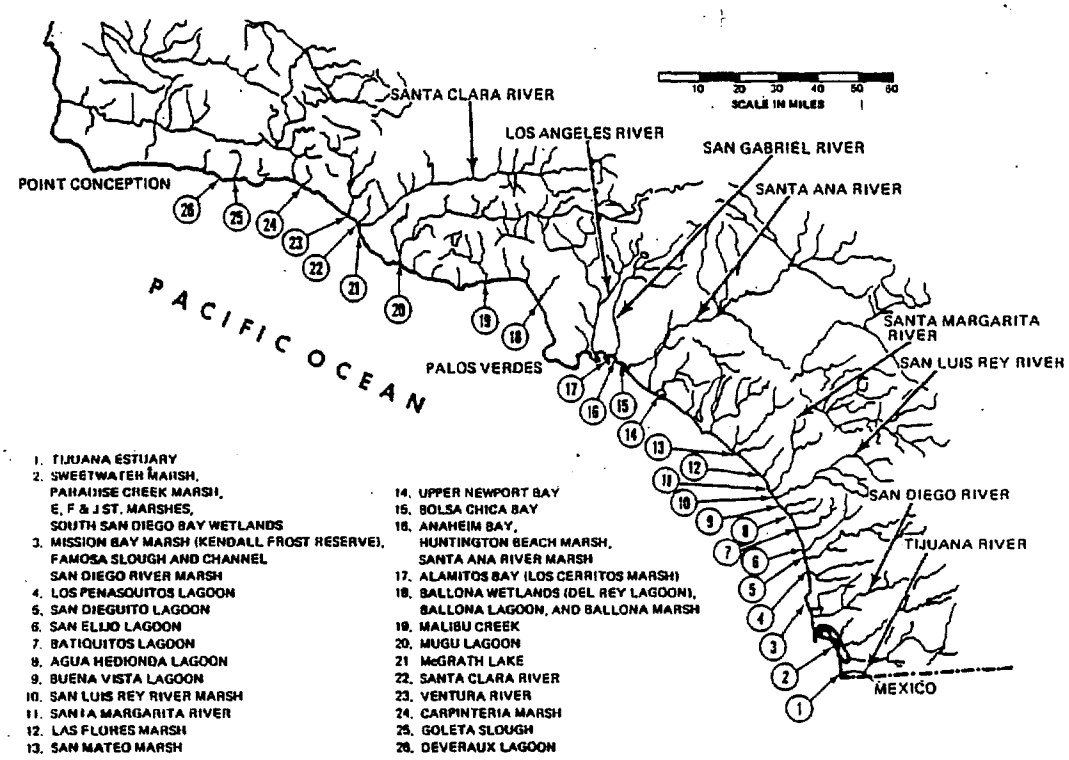
In summary, like topography and hydrology, water quality also has a direct role in the ecology of wetlands. Evidence to date shows salinity is probably the most important water quality constituent in coastal wetlands, although pollutants, turbidity, nutrients, and a variety of other constituents can also be very important at certain times and locations.

D. Biological Interactions:

The diversity and abundance of organisms in coastal wetlands is remarkable, given the often extreme and variable conditions that can occur. Bacteria, protozoa, algae, vascular plants, invertebrates, amphibians, fish, birds, and mammals can all be found within the wetland, and together comprise the biotic community of the wetland. Many of these organisms are completely dependent on the wetland for their existence, either spending their entire lives in the wetland, or spending a critical portion of their life cycle in the wetland. Still other species receive direct benefit from wetlands but are not dependent upon wetlands for their existence.

The interactions among these organisms are obviously complex and numerous, but basically occur in response to environmental tolerances and resource requirements. For example, vascular plants show strong patterns of distribution within a wetland that are related to their tolerance of specific environmental conditions, such as salinity, soil type,

FIGURE 8 — Location Map of Southern California Coastal Wetlands and Major Rivers



Source: Zedler, 1982.

with this complex and variable hydrology, coastal wetlands are unified as a system by low gradients, low wave energy, fine-grain sediments and pervasive saltwater influences (Orme, 1991). In California, many coastal wetlands are marine dominated during much of the year, becoming dominated by terrestrial freshwater sources primarily during rainy periods (Josselyn, 1983; Zedler, 1982). In addition, these systems are directly affected by the multi-year drought/flooding events (as is much of California). Thus, for much of the year tidal processes drive coastal wetland hydrology, although seasonally and/or locally important freshwater inputs do occur.

As might be expected, hydrodynamic processes affect many of the environmental and biological processes within wetlands. For example, wetland hydrology affects both the location and rate of sedimentation and erosion, as well as the distribution and concentration of important chemical constituents such as dissolved oxygen, nutrients, and salt (Orme, 1991). In Southern California, tidal processes are extremely important in structuring the salt marsh communities. Sea water provides most of the soil moisture for these intertidal wetlands because of the low precipitation, the limited freshwater runoff, and frequent droughts (Zedler, 1982). The variable tidal regime present in California (i.e., a mixed semidiurnal tidal regime), and the semiarid climate that dominates southern California result in an extremely broad range of wetland soil salinity and long periods of hypersalinity (Zedler, 1982). Soil salinity, in turn, directly affects the distribution of plants within the wetland (Zedler, 1982). In contrast, hydrodynamic processes are affected by the presence or absence of vegetation. Wetland plants such as *Spartina foliosa* reduce current velocities, dampen waves, discourage erosion, and promote sediment deposition (Orme, 1991).

From this brief discussion it is clear that California's coastal wetlands are strongly affected by hydrologic processes, which are highly variable and complex. Thus, although many wetlands may appear to be in equilibrium with their environment, that equilibrium is neither static nor predictable (Orme, 1991).

C. Water Quality:

Interest in wetland water quality has intensified recently, because of the ability of wetlands to enhance water quality. Through a variety of processes, wetlands are able to remove sediments and both organic and inorganic pollutants from the overlying water (Chan, et al., 1981; Duda, 1992; Sather and Smith, 1984). In addition, however, several water quality constituents have a direct impact on the ecology of coastal wetlands, the most significant of which is probably salt concentration.

Ocean water is the principal source of salts in coastal wetlands, and source inputs are continually renewed by tidal flows. Thus, the tides are not only responsible for physical processes (i.e., hydrology), but chemical processes as well. Through its influence on soil

and hydrology, and the competitive interactions that occur among species for limited resources such as recruitment space, nutrients, and light[35]. The same is generally true for animals, but their mobility affords them the flexibility to seek out more suitable habitat. Additionally, animals consume plants and other animals adding another dimension of interaction, namely predator-prey relationships, which can alter the distribution and abundance patterns of both the predator and the prey[25].

Another way to characterize biological interactions is on the basis of energy flow. With the exception of plants, which use sun light as their energy source, all organisms found in wetlands consume plants or animals to meet their energy requirements. This energy in turn, is used by the organism for growth and reproduction.

Diagrams of a food chain or food web (many food chains) are used to conceptualize the flow of energy within an ecosystem. Figure 9 shows a diagram of one such food chain. In general, plants (vascular plants and algae) are termed primary producers and are at the base of the food chain. The next level up the food chain is occupied by herbivores followed by omnivores and carnivores. Energy is lost to respiration at every level of the food chain; thus an enormous amount of plant material is required to provide the energy necessary for the existence of top predators such as carnivorous birds and mammals. Although food chains can be very complex, they do provide a relatively simple way to conceptualize biological interactions. The food chains within many California coastal wetlands are thought to be relatively short (Zedler, 1982). Nonetheless, the wetland food web is complex because of the extensive overlap and shear number of food chains that exist. In general, our knowledge of how food chains are modified as wetland habitat diminishes is not extensive; however, there is little doubt that the native food web is essential to the maintenance of community structure (National Research Council, 1992).

Although a multitude of concepts, principles, and methodologies exist to assist in understanding the biology and ecology of wetlands, our level of knowledge is still relatively rudimentary. This is particularly true for California's wetlands, where ecosystem research lags behind that of Atlantic and Gulf coast efforts by several decades (Williams and Zedler, 1992). We now know that the environment of Pacific coast wetlands differs in fundamental ways (e.g., topography, geology, hydrology,

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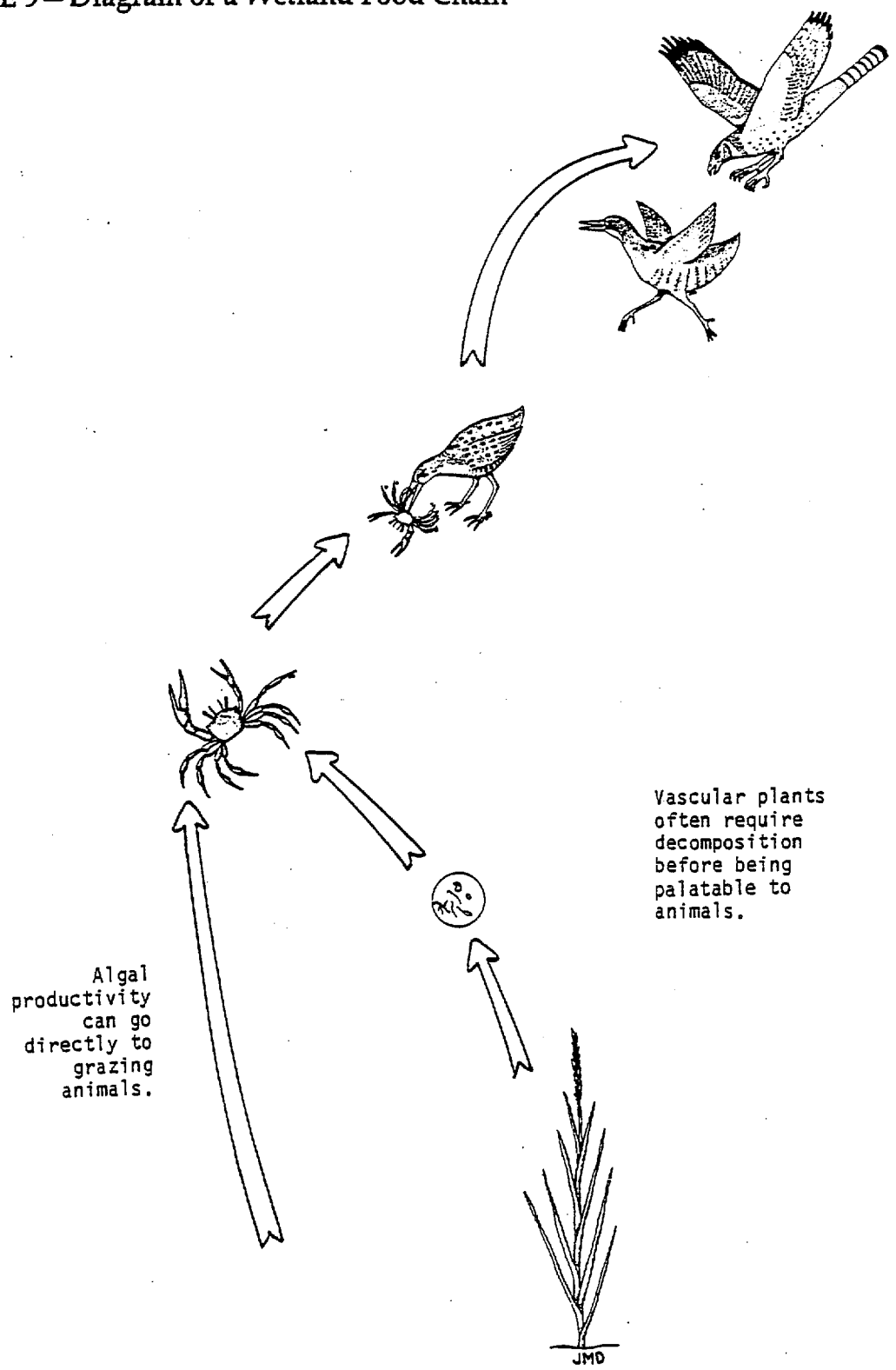
[35] For detailed examples from California's coastal wetlands see: Zedler, J.B. 1982. *The ecology of southern California coastal salt marshes: a community profile.* U.S. Fish and Wildlife Service, Biological Services Program, Washington D.C. FWS/OBS-81/54; and Josselyn, M. 1983. *The ecology of San Francisco Bay tidal marshes: a community profile.* U.S. Fish and Wildlife Service, Division of Biological Services, Washington D.C. FWS/OBS-83/23.

FIGURE 9—Diagram of a Wetland Food Chain



Source: Zedler, 1982.

climate, and species composition) from wetlands in other parts of the nation. Thus, information from Atlantic or Gulf coast wetlands does not necessarily apply to Pacific coast wetlands. Additionally, it is difficult to transfer information between coasts on processes such as primary productivity and nutrient cycling because the functions driving these processes are site specific; however, the effects of habitat loss and reduced biodiversity are universal (Williams, et al., 1992). Nevertheless, the task of developing the technical information base necessary for the wise and successful management of California's coastal wetlands is critical.

III. UNDERSTANDING THE FUNCTIONS AND VALUES OF COASTAL WETLANDS:

Assessing the functions and values of wetlands depends on, and is limited by, information from three fields: science, economics, and politics (Scodari, 1990). For example, scientists have determined that wetlands serve (i.e., function) as critical habitat for a number of threatened and endangered species, while State and federal legislation affords such species higher levels of protection, and therefore increased value. However, because of their limited numbers, threatened and endangered species often contribute little net value to the wetland on an ecological (scientific) or economic basis.

As the above example illustrates, the functions and values of wetlands are often interconnected. In general, wetland functions are those attributes that directly or indirectly benefit humans and other organisms, or provide values perceived by humans as desirable or worthy of protection. However, there is limited agreement on the importance of any one function or value. As Dennis and Marcus (1984) note "[p]resent day land owners, developers, regulatory agencies, and scientists in California are not in agreement on the value of wetlands. A landowner or developer may see a wetland only as flat, developable real estate, made more valuable by its proximity to a waterfront. Traditionally, communities have viewed wetlands as convenient dumping grounds. Engineers acknowledge the functional uses of wetlands for floodwater regulation or shoreline protection... Scientists and educators place a high value on the biological productivity and wildlife habitat of wetlands. A hunter appreciates wetlands for the waterfowl they support, while a farmer may regard a wetland as unproductive unless drained and cultivated."

All of the known functions and values of coastal wetlands are a manifestation of one or more of the physical, chemical, or biological processes inherent to this environment. However, wetland assessments based on functions and values are problematic due to the lack of rigorous and objective assessment criteria. Recent attempts have used economic principles to develop monetary valuations (Allen et al., 1992; Scodari, 1992). Although this is a valid approach, it does not include estimates of intrinsic qualities such as natural beauty, fascination, and peace of mind. Nevertheless, such assessments

are important because many of the regulatory decisions regarding wetlands are ultimately decided on the relative importance of these attributes, or the cost to replace them.

Overall, California coastal wetlands have a number of important functions and values[36] (Table 3). Although knowledge of most functions and values has existed for some time, their combined importance has increased over time because of the enormous wetland losses California has endured. Thus, the reduction in wetland acreage and function has increased the overall value of this resource regardless of the value of specific attributes (Allen, et al., 1992).

Table 3

KEY FUNCTIONS AND VALUES OF CALIFORNIA'S COASTAL WETLANDS[37]

Commercial factors
■*Support of commercial fisheries*: Coastal wetlands are important spawning and nursery areas and provide sources of nutrients for commercial fish such as flounder, perch, and English sole, and shellfish such as clams and shrimp.
■*Provision of commercially harvested organisms*: Because of their high natural productivity, both tidal and inland wetlands have food production potential for aquaculture enterprises.
■*Water supply and storage*: Wetlands are potential sites for groundwater recharge and surface water storage.
Damage prevention factors
■*Pollution assimilation/water purification*: Wetlands contribute to improving water quality by removing excess nutrients and excess chemical contaminants; some wetlands are used in the tertiary treatment of wastewater.
■*Flood control*: Riverine wetlands and adjacent floodplain lands often form natural floodways that convey floodwaters from upstream to downstream areas; wetlands can also store water during floods and slow the movement to downstream areas, thereby lowering flood peaks.
■*Erosion control*: Wetlands reduced flood flows and the velocity of floodwaters, reducing erosion causing floodwaters to release sediment.

36 For a more detailed discussion of wetland functions and values the reader is encouraged to review: Sather, J.H. and R.D. Smith. 1994. *An Overview of Major Wetland Functions and Values*. U.S. Fish and Wildlife Service. FWS/OBS-84/18; and National Research Council. 1992. *Restoration of Aquatic Ecosystems*. National Academy Press, Washington D.C.

37 Sources: Scodari, 1990; National Research Council, 1992

Table 3 Continued

KEY FUNCTIONS AND VALUES OF CALIFORNIA'S COASTAL WETLANDS

Ecological factors
■*Provision of critical habitat for threatened and endangered species*: In California numerous threatened or endangered species such as the Santa Cruz long-toed salamander, the clapper rail, the salt marsh harvest mouse, and the soft-haired bird's beak all rely on wetlands for their existence.
■*Provision of habitat for native wildlife*: Wetlands provide essential breeding, feeding, and refuge habitats for many native plants (e.g., cord grass, salt grass, and pickleweed) and animals (e.g., great blue heron, garter snake, and the tiger salamander); this directly contributes to the maintenance of biodiversity.
■*Provision of resting and feeding habitat for migratory waterfowl*: California's wetlands provide essential nesting, feeding, and refuge habitats for migratory birds along the Pacific flyway; this directly contributes to the maintenance of biodiversity.
■*Food chain support to resident and non-resident species*: Wetlands have the ability to support nutrient transformations (both microbial and chemical processes); wetlands act as sources and sinks of nutrients and food and provide a medium for the transfer of these materials.
Other factors
■*Consumptive recreation*: Wetlands serve as recreation sites for fishing and hunting.
■*Nonconsumptive recreation*: Wetlands serve as recreation sites for hiking, boating, and bird watching.
■*Source of open space and contribution to aesthetic values*: Wetlands are areas of great diversity and beauty, and provide open space for human enjoyment.
■*Education and research*: Wetlands provide educational opportunities for nature observation and scientific study.

IV. FACTORS IMPACTING CALIFORNIA'S COASTAL WETLANDS:

The major impact suffered by California's wetlands is direct loss attributable to human activities (Dennis and Marcus, 1984). Total wetland loss in California is estimated at 4.6 million acres, which is approximately 91% of the acreage present before European settlement (Dahl, 1990). The majority of this loss (approximately 3.6 million acres) has occurred in the central valley (Dahl, 1990; Dennis and Marcus, 1984). All portions of the coast have suffered losses as well, the largest losses (on a percentage basis) are thought to have occurred in San Francisco Bay and along the south coast (Table 4).

Table 4

SUMMARY OF HISTORIC LOSSES OF CALIFORNIA COASTAL WETLANDS[38]

Region	Estimated Original Acreage	Estimated Remaining Acreage	Estimated Percent Reduction
North Coast	Unknown	31,300	Unknown
Central Coast[39]	Unknown	3,800	Unknown
S.F. Bay[40]	200,000	93,000	54 %
South Coast	53,000	13,100	75 %
Statewide	5,000,000	450,000	91 %

A variety of activities are known to have caused the dramatic loss and alterations of wetlands in California. The major activities include:

- *Agricultural use and development:* This involves the conversion of wetlands to agricultural land. Typically, wetlands are diked or filled, or vegetation is removed in order to expand adjacent crop or grazing lands. Disturbance and degradation can also occur where cattle and other pasture animals are allowed to graze in wetlands, or where nonpoint-source runoff containing pesticides and fertilizers occurs. Agricultural activities are the primary cause of wetland loss in California (Dahl, 1990).

- *Residential development:* The development and subdivision of land for residential use has resulted in direct wetland loss through filling. Additionally, this development activity has substantially increased sediment discharge into wetlands, through the acceleration of soil erosion. This is especially true in southern California where extensive building has occurred on or near highly erodible soils (Zedler, 1982).

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38 Source: Dennis and Marcus, 1984.

39 Central Coast numbers exclude San Francisco Bay.

40 Estimates for S.F. Bay updated from: Meiorion, E.C., M.N. Josselyn, R. Crawford, J. Calloway, K. Miller, R. Pratt, T. Richardson, and R. Leidy. 1991. *Status and trends report on wetlands and related habitats in the San Francisco estuary.* San Francisco Estuary Project, Oakland, California.

- *Commercial and industrial development:* Hotels, business parks, and industrial complexes within and adjacent to wetlands can include wetland fill and loss of habitat through encroachment. The release of toxic materials from these forms of development is also a source of wetland degradation.

- *Oil and Gas development:* Oil and gas wells and the supporting infrastructure have severely impacted several coastal wetlands in Southern California. The deposition of fill for roads and well pads and the unintentional release of pollutants from this form of development results in the fragmentation and degradation of wetland habitat.

- *Roads highways and railways:* The maintenance and development of transportation corridors has resulted in direct wetland loss through filling. Numerous wetlands have also suffered adverse impacts from the construction of bridges and polluted runoff from these structures.

- *Port and marina development:* This form of development includes dredging new and expanded channels to increase deepwater area, and the direct filling of wetlands to increase the area of shoreline support facilities.

- *Flood control:* Development in flood plains and adjacent to wetlands increases the susceptibility of these structures to flooding. Flood control projects result in the dredging, filling, and channelization of wetlands to prevent the natural dissipation of water into low-lying areas.

Many of these activities still occur in California (Dennis, et al., 1984). Yet because of the relatively high social value placed on coastal wetlands, this resource has received greater protection than their inland counterparts (Gosselink, et al., 1991). In California's coastal zone, the Coastal Act does allow certain types of development in wetlands (see chapters one and three), and these activities can result in the loss of wetland habitat. However, wetland alteration in many coastal states of the U.S. —including California— is strictly regulated and generally prohibited. Much of the current loss of wetlands in the coastal states is attributed to either a lingering legacy of past development (e.g., agricultural, urban, and industrial development) or related to secondary or indirect effects of current projects (e.g., point- and nonpoint-source pollution, or changes in the timing and amount of fresh and saltwater inputs) (Gosselink, et al., 1991).

V. SUMMARY:

Wetland resource concerns for California span a variety of complex and sensitive issues. Of paramount concern is the extreme loss of wetlands California has endured, dramatically increasing the intrinsic value of the remaining resource. However, numerous other issues discussed in this chapter also affect the level and focus of concern for this resource. These issues, which are summarized below, generally fall into one of two categories: science and impacts.

1) Science:

- Large scale evolutionary processes have acted to produce a highly variable coastal zone with numerous, relatively isolated and unique wetland landscapes. This fact complicates preservation and restoration activities.

- Wetlands are ecologically complex regions.

- Sound scientific information on California coastal wetlands is lacking, limiting our understanding and predictive ability.

- Rigorous, objective methods to quantify wetland functions and values are generally lacking.

2) Impacts:

- Human's are responsible for virtually all of the losses and impacts to California's wetlands.

- Many of the remaining wetlands suffer from chronic disturbance and degradation.

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GLOSSARY

Anaerobic Soil: Soil that is devoid of interstitial oxygen. In wetlands this condition most normally occurs because of the sustained presence of water, which limits contact with the atmosphere.

Biogenic: Chemicals or material created (generated) by biological processes. For example, waste products are generated through the biological processes of digestion.

Carnivore: Animals whose diet normally includes only other animals.

Detritus: Organic debris from decomposing plants or animals.

Ecotone: A habitat created by the juxtaposition of distinctly different habitats; an edge habitat, or a zone of transition between habitat types. For example, the intertidal zone is an ecotone occurring at the intersection between the subtidal zone and dry land.

Estuarine: The estuarine environment consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partially obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

Former Wetland: A land area originally existing as a wetland, which has been altered to another land-form through human or natural processes. Agricultural lands created from the diking or filling of wetlands are an example of former wetlands. Former wetlands do not generally exhibit any of the original wetland characteristics (i.e., form and function). In contrast, degraded wetlands do exhibit some of the original wetland characteristics, although often to a lesser extent.

Fen: A unique type of wetland characterized by a saturated substrate dominated by organic material in which acidic conditions (pH < 7) prevail. Contrast with a bog, which has a saturated substrate dominated by organic material in which basic conditions (pH > 7) prevail.

Hydric Soil: A type of soil with characteristics resulting from prolonged saturation and chemically reducing conditions such as occurs under anaerobic conditions. (See Anaerobic Soil above.)

Hydrology: The dynamic processes of the water within an environment including the sources, timing, amount, and direction of water movement.

Hydrophytic Vegetation: Plants that have adapted to living in aquatic environments. These plants are also called hydrophytes. In wetlands, hydrophytic species occur where at least the root zone of the plant is seasonally or continually found in saturated or submerged soil.

In-Kind-Mitigation: A mitigation project in close proximity to the site of impact that is designed to replace lost resources with identical or very similar resources.

Lacustrine: A lake or lake-like environment. Cowardin et al. (1979) define the lacustrine environment as "wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or dammed river channel; (2) lacking trees, shrubs, persistent emergent plants, mosses, or lichens with greater than 30% areal coverage; and (3) total area exceeds 8 ha (20 acres). Similar wetland and deepwater habitats totaling less than 8 ha are also included in the lacustrine environment if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary, or if the water depth in the deepest part of the basin exceeds 2 m (6.6 feet) at low water. Lacustrine waters may be tidal or non-tidal, but ocean-derived salinity is always less than 0.5 parts per thousand."

Macrophytes: Plants visible to the unaided eye. In terms of plants found in wetlands, macrophytes are the conspicuous multicellular plants.

Marine: The marine environment consists of the ocean and the associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean and the water regimes are determined primarily by the ebb and flow of oceanic tides.

Mixed semidiurnal tidal regime: The tidal regime occurring along the California coast. This tidal regime is characterized by two high tides and two low tides every 25 hours. The tidal extremes (point of maximum high or low water) all differ and occur in a mixed sequence. That is, the higher high tide is followed by the lower low tide, followed by the lower high tide, and then the higher low tide. The tidal height is primarily determined by gravitational forces among the Earth, moon, and sun, but is also affected by weather and local geography.

Nitrogen Fixation: Biochemical conversion of atmospheric nitrogen into nitrogen compounds such as nitrate and nitrite. This process is naturally carried out by certain soil-inhabiting bacteria and certain blue–green algae.

Nutrients: Chemical compounds or elements required by all living organisms for growth, reproduction, and the maintenance of homeostasis. Most commonly, measurements are taken from water samples to determine the concentration of nutrients required by plants (e.g., primary producers). For plants, inorganic macronutrients (i.e., nutrients required in relatively large amounts) include nitrate, nitrite, ammonium, and phosphates. Inorganic micronutrients (i.e., nutrients required in relatively small amounts) include copper, molybdenum, and magnesium. Organic nutrients include amino acids and vitamins.

Omnivore: Animals whose diet normally included both plants and animals.

Out-of-Kind mitigation: A mitigation project that replaces lost resources with resources that are not similar (e.g., using an artificial reef as mitigation for filling a salt marsh). The mitigation project may or may not be in close proximity to the site of impact.

Palustrine: The palustrine environment includes all non-tidal wetlands dominated by trees, shrubs, persistent emergent macrophytes, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 5 parts per thousand (ppt). It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features are lacking; (3) water depth in the deepest part of the basin is less than 2 m at low water; and (4) salinity due to ocean-derived salts is less than 5 ppt (Cowardin et al., 1979).

Plate tectonics: The theory that accounts for seismic activity, mountain building, volcanism, and other geological manifestations of crustal plate movement with sea-floor spreading.

Productivity: The transfer of energy and nutrients into living matter over time. Productivity is a function of both the growth rate and biomass of an organism and is expressed as a rate of change. For example, primary productivity is the rate of increase in plant material over a unit area and time e.g., grams Carbon/m^2/yr. Secondary productivity applies to animals and is expressed in the same terms.

Remineralization: Release of nutrients and other compounds chemically bound in soils or sediments through chemical processes.

Respiration: (1) Internal respiration: the chemical processes from which all living organisms derive energy from stored reserves and food. (2) External respiration: breathing of air; taking oxygen from the environment and giving off carbon dioxide.

Riparian Area: A type of habitat occurring along the bank of a water course or other water body typically consisting of water tolerant trees and shrubs such as alder, cottonwood, and willows. Many riparian areas occur as bands of vegetation along a water course, often called riparian corridors.

Riverine: An aquatic environment with a water source conveyed by a channel. A channel is an open conduit either naturally or artificially created that periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water. Rivers, streams, creeks, and aqueducts are all riverine environments.

Tidal Prism: The volume of water that flows in and out of an area between higher high tide and lower low tide.

Vernal Pool: A seasonal wetland formed in depressions having a specific geology and hydrology, which directly influence the plants and animals found within.

Water quality: Most generally described as the physical, chemical and biological integrity of the water.

Appendix A

Statewide Interpretive Guidelines For Wetlands And Other Wet Environmental Sensitive Habitat Areas

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STATEWIDE INTERPRETIVE GUIDELINE FOR WETLANDS AND OTHER WET ENVIVIRONMENTALLY SENSITIVE HABITAT AREAS (Adopted 2/4/81)

I. INTRODUCTION

The Commission adopted this guideline as a decision of the Commission after receiving extensive public testimony and comments and holding ten public hearings at numerous locations in the coastal zone. In addition, the Regional Commissions provided valuable comments and information as a result of an approximately equal number of hearings which they held. Guidelines should be viewed as a tool in reviewing coastal permit applications and LCPs for wetlands and adjacent areas. The Commission intends local governments to use the guideline when developing LCPs but believes that more flexibility may be appropriate in an LCP than in an individual permit decision. Guidelines of necessity must focus on issues primarily of statewide concern. The LCPs will focus in depth on regional wetlands issues. For example, the Humboldt County Northcoast Area Land Use Plan addressed farmed wetlands in detail, a subject only footnoted in this guideline. It adopted explicit criteria for identifying farmed wetlands and designated the areas exclusive agriculture. The Commission certified the LUP as consistent with the policies of Chapter 3, even though such specific criteria are not contained or endorsed in this guideline. This example illustrates that the guideline is a valuable tool, but only a tool, to be used in conjunction with permit and planning decisions.

A. What Are "Wetlands"?

The Coastal Act defines wetlands as land "which may be covered periodically or permanently with shallow water." Wetland areas, such as marshes, mudflats and lagoons, serve many functions: to absorb pollutants and storm energy; to serve as nutrient sources and genetic reservoirs; and to provide some of the world's richest wildlife habitats.

Wetlands are highly diverse and productive. The combination of shallow and deep water, and the variety of vegetation and substrates produce far greater possibilities for wildlife feeding, nesting and resting than is found in less diverse areas. Individual wetlands may be inhabited by hundreds of species of birds, mammals, fish and smaller organisms. Abundant microorganisms serve as food for crabs, clams, oysters, and mussels which live in the tidal flats.

Wetlands' natural abundance draws people for recreation such as clamming, bird watching and fishing. Fish such as the king and silver salmon and steelhead trout live much of their lives in the ocean but return to freshwater to spawn. Commercially important fish such as herring, anchovy and California halibut are also found in California's estuaries.

Food for ocean fauna is supplied from California's coastal estuaries. Estuarine productivity therfore contributes to a complex ocean food web. For example, a significant amount of the net areal primary productivity of the Tijuana Estuary is exported in the form of dissolved carbon which can be taken up and used by oysters, bacteria and phytoplankton, which may in turn be eaten by other creatures. Perhaps more importantly, estuaries provide habitat for organisms to use that food, therefore making these habitats important for man, for example, as aquaculture sites.

Migratory animals feed and rest in California's coastal wetlands in large enough numbers to make the wetlands invaluable habitat areas. Most waterfowl and shorebirds found in North America, such as ducks, geese, sandpipers, and dunlines, are migratory. They nest in Alaska or Canada in the summer, and winter in the U.S. or points south. During the fall and spring migrations, millions of these birds move along well-defined routes called flyways. The California coast, part of the Pacific Flyways, was assigned third highest priority (out of a total of 33 areas nationally) for wintering habitat preservation by the U.S. Fish and Wildlife Service.

Wetlands also serve as rich laboratories for ecological studies.

B. How the Coastal Act Protects Wetlands

Since wetlands are so valuable from both an economic and biologic standpoint, the California Coastal Act, and many other Federal and state statutes and regulations, mandates governmental regulation of these areas. Section 30001 of the Coastal Act states (in part) that the Legislature finds and declares as follows: that the California coastal zone is a distinct and valuable resource and exists as a delicately balanced ecosystem; that the permanent protection of the state's natural resources is of paramount concern to present and future residents of the state and the nation; and that it is necessary to protect the ecological balance of the coastal zone and prevent its deterioration and destruction. Therefore, the Act requires that the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes be maintained and, where feasible, restored. Sections of the Act provide general policies for development in and adjacent to wetlands, and specific policies for protecting these areas.

In order to apply Coastal Act policies on wetlands to specific areas and developments, the Commission has adopted this interpretive guideline. The guideline integrates ecological concepts and policies found in many sections of the Act into a consistent whole, explains policies for protecting natural resources, defines technical terms, and facilitates application of the policies by the State and regional commissions. Since many of the natural resource policies in the Coastal Act overlap, this guideline distinguishs the relative importance of the policies and their interrelationships. Statutory provisions which govern all environmentally sensitive habitat areas are laid out and specific development standards and criteria are explained for particular habitat areas (e.g., wetlands, estuaries, open coastal waters, lakes and streams).

Wetlands are not isolated, independently functioning systems, and they depend upon and are highly influenced by their surroundings. Therefore, the guideline includes standards for the review and evaluation of proposed projects adjacent to environmentally sensitive habitat areas.

The State Department of Fish and Game is the authorized custodian of California's fish and wildlife resources and serves as the Commission's principal consultant on all matters related to these resources. This responsibility includes but is not limited to: determination of project impacts; adequacy of technical data; and identification of appropriate mitigation or restoration measures for affected habitat.

C. Use of the Guideline and Its Relationship to LCPs

This guideline is meant to assist the public and the Commissions in applying Coastal Act policies for wet environmentally sensitive habitat areas and is in no way meant to supersede those policies. The guideline should be viewed as a tool in reviewing coastal permit applications and LCPs for wetlands and adjacent areas as explained above.

The question of the relationship between interpretive guidelines and Local Coastal Programs (LCPs) has been hotly debated and underscores the importance of developing a comprehensive, consistent approach to these valuable coastal areas, but the LCPs (such as Humboldt County example discussed above) become the standard of review after certification. This guideline is a decision of the Commission, and therefore, it does serve as a tool or guide to local governments in preparing their LCPs as specified in Section 30625 (c) of the Act and in Section 00113 of the LCP Regulations.

II. WHAT ARE "ENVIRONMENTALLY SENSITIVE HABITAT AREAS"?

The Coastal Act defines "environmentally sensitive area" in Section 30107.5 as follows:

> "'Environmentally sensitive area' means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments."

The term "environmentally sensitive habitat area" is also used in Section 30240 of the Coastal Act. The two terms are synonymous.

The Commission generally considers wetlands, estuaries, streams, riparian habitats, lakes and portions of open coastal waters to be environmentally sensitive habitat areas because of the especially valuable role of these habitat areas in maintaining the natural ecological functioning of many coastal habitat areas and because these areas are easily degraded by human developments. In acting on an application for development one of these areas, the Commission considers all relevant information. The following specific policies apply to these habitat areas: Sections 30230; 30231; 30233; and 30236. Section 30240, a more general policy, also applies, but the more specific language in the former sections is controlling where conflicts exist with general provisions of Section 30240 (e.g., port facilities may be permitted in wetlands under Section 30233 even though they may not be resource dependent). This guideline addresses wet environmentally sensitive habitat areas only. The discussion in this section and in section VII is not intended to describe or include all environmentally sensitive habitat areas which may fall under Section 30240 of the Coastal Act.

As stated in the "INTRODUCTION," wetlands are not isolated, independently functioning systems. Rather, they depend upon and are highly influenced by their associated watersheds and upland transition areas. Therefore, when the Commission determines that any adjacent area is necessary to maintain the functional capacity of the wetland, the Commission will require that this area be protected against any significant disruption of habitat values consistent with Section 30240(a). These areas may be protected either by inclusion in a buffer area subject to land use restrictions or through provision of a buffer area around the ecological related adjacent area itself, or through other means. Section VII of this guideline discusses the use of buffers.

A. "Wetlands"

The Coastal Act defines "wetland" in Section 30121 as follows:

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

This is the definition upon which the Commission relies to identify "wetlands." The definition refers to lands "...which may be periodically or permanently covered with shallow water ..." However, due to highly variable environmental conditions along the length of the California coast, wetlands may include a variety of different types of habitat areas. For this reason, some wetlands may not be readily identifiable by simple means. In such cases, the Commission also will rely on the presence of hydrophytes and/or the presence of hydric soils as evidence that an area may be periodically or permanently covered with shallow water. These are useful indicators of wetland conditions, but the presence or absence of hydric soils and/or hydrophytes alone are not necessarily determinative when the Commission identifies wetlands under the Coastal Act. In the past, the Commission has considered all relevant information in making such determinations and relied upon the advice and judgement of experts before reaching its own independent conclusion as to whether a particular area will be considered wetland under the Coastal Act. The Commission intends to continue to follow this policy. The discussion in "APPENDIX D" provides more detail and further guidance on wetland identification.

B. "Estuaries"

An "estuary" is a coastal water body usually semi-enclosed by land, but which has open, partially obstructed, or intermittent exchange with the ocean and in which ocean water is at least occasionally diluted by fresh water runoff from the land. The salinity may be periodically increased above the open ocean by evaporation. In general, the boundary between "wetland" and "estuary" is the line of extreme low water (see Appendix D for a more complete discussion of wetland/estuary boundaries).

C. "Streams" and "Rivers"

A "stream or a "river" is a natural watercourse as designated by a solid line or dash and three dots symbol shown on the United States Geological Survey map most recently published, or any well-defined channel with distinguishable bed and bank that shows evidence of having contained flowing water as indicated by scour or deposit of rock, sand, gravel, soil, or debris.

D. "Lakes"

A "lake" is a confined, perennial water body mapped by the United States Geologic Survey on the most current 7.5 minute quadrangle series.

E. "Open Coastal Waters" and "Coastal Waters"

The terms "open coastal waters" or "coastal waters" refer to the open ocean overlying the continental shelf and its associated coastline. Salinities exceed 30 parts per thousand with little or no dilution except opposite mouths of estuaries (see Appendix D).

Some portions of open coastal waters, generally areas without especially significant plant or animal life, may not be considered environmentally sensitive habitat areas. Environmentally sensitive habitat areas within open coastal waters may include "Areas of Special Biological Significance" as identified by the State Water Resources Control Board, habitats of rare or endangered plant and animal species, nearshore reefs, rocky intertidal areas (such as tidepools), and kelp beds.

F. "Riparian Habitats"

A "riparian habitat" is an area of riparian vegetation. This vegetation is an association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of fresh water (see Appendix D).

III. WHEN IS DEVELOPMENT PERMITTED IN AN ENVIRONMENTALLY SENSITIVE HABITAT AREA?

"Development" is defined in Section 30106 of the Coastal Act, and includes the placement of fill; construction or alteration of any structure or facility; discharge of any waste material; dredging or extraction of any materials; change in the density or intensity of use of land; removal or harvest of major vegetation except for agricultural purposes; and other alterations to the land and water in the coastal zone (see Appendix A).

A. Requirements For All Development Proposals in Environmentally Sensitive Habitat Areas

Under the Coastal Act, there are two basic steps in determining if development is permitted in an environmentally sensitive habitat area. First, the type of development proposed must be a permitted use under the applicable section of the Coastal Act. For example, any development proposed in a wetland must be specifically described in Section 30233(a) of the Act. The permitted developments allowed in each type of environmentally sensitve habitat area are discussed in subsequent sections. Additional permitted developments in environmentally sensitive habitat areas are projects which depend on the natural resources in that habitat area and therefore require a site in that particular type of environmentally sensitive habitat area in order to function.

Second, any permitted use must also meet all general requirements. For example, before development could be approved in a wetland, the Commission must find that there is no feasible, less environmentally damaging alternative, that feasible mitigation measures have been provided to minimize adverse environmental effects, and that the functional capacity of the wetland is maintained or enhanced. These requirements are discussed in subsequent sections.

B. Requirements for Additional Project Information

To meet the statutory requirements of Sections 30230, 30231, 30233, 30236, and 30240 of the Coastal Act, an applicant for a permit to develop within or near an environmentally sensitive habitat area may be required to submit supplemental information, including any or all of the maps described below. The size of the study area will depend upon natural topographic features, location of existing development, and potential biological significance of adjacent lands. In undeveloped areas, the required study area may extend 500 feet or more around the environmentally sensitive habitat area, but the 500 foot distance is not an absolute standard. It is recommended that this information be developed before the application comes before the Commission, but the Commission may require additional information as a part of its permit process.

When there is a dispute over the adequacy of the information, the Commission will request the State Department of Fish and Game to review the material and submit written comments to the Commission. A qualified private professional acceptable to the applicant may be employed by the Commission to assist in this review or to provide additional information. The Commission may require the applicant to reimburse it for any reasonable expenses incurred in providing additional information or in the review of the applicant's information.

1. Maps

a. Topographic base map. The base map should be at a scale sufficiently large to permit clear and accurate depiction of vegetative associations and soil types in relation to any and all proposed development (normally the scale required will be 1"=200'). Contour intervals should be five feet, and the map should contain a north arrow, graphic bar scale, and a citation for the source of the base map (including the date). The map should show the following information:

1) Boundary lines of the applicant's property and adjacent property, including assessor's parcel numbers, as well as the boundaries of any tidelands, submerged lands or public trust lands.

2) Names and locations of adjacent or nearby roads, streets or highways, and other important geographic, topographic and physical features.

3) Location and elevation of any levees, dikes or flood control channels.

4) Location, size and invert elevation of any culverts or tide gates.

b. Inundation map. For nontidal wetlands, a map should be prepared indicating permanent or seasonal patterns of inundation (including sources) in a year of normal rainfall.

c. Vegetation map. Location and names of plant species (e.g., *Salicornia virginica*) and vegetation associations (e.g., saltmarsh). This map should be prepared by a qualified ecologist or botanist based upon the technical criteria provided in Appendix D.

c. Soils map. If no soil survey is available, a soils map should be prepared by a qualified soils scientist, and should show the location of soil types and include a physical description of their characteristics based upon the technical criteria provided in Appendix D.

2. Supplemental information

A report should be prepared which demonstrates that all of the criteria for development in environmentally sensitive habitat areas have been met. The report should investigate physical and biological features existing in the habitat area and evaluate the impact of the development on the existing ecosystem. The information should be prepared by an ecologist or professional environmental scientist with expertise in the ecosystem in which the development is proposed. For example, in preparing such a report for a proposed development in a salt marsh, the expertise of a qualified wetland ecologist, botanist, ornithologist, hydrologist, soil scientist or other technical professional may be required. The report should be based on an on-site investigation, in addition to a review of the existing information on the area, and should be sufficiently detailed to enable the Commission to determine potential immediate and long range impacts of the proposed project.

The report should describe and analyze the following:

a. Present extent of the habitat, and if available, maps, photographs or drawings showing historical extent of the habitat area.

b. Previous and existing ecological conditions.

1) The life history, ecology and habitat requirements of the relevant resources, such as plants, fish and wildlife, in sufficient detail to permit a biologist familiar with similar systems to infer functional relationships (the maps described in above may supply part of this information).

2) Restoration potentials.

c. Present and potential adverse physical and biological impacts on the ecosystem.

d. Alternatives to the proposed development, including different projects and off-site alternatives.

e. Mitigation measures, including restoration measures and proposed buffer areas (see pp. 14-17 and pp. 20-23).

f. If the project includes dredging, explain the following:

1) The purpose of the dredging.

2) The existing and proposed depths.

3) The volume (cubic yards) and area (acres or square feet) to be dredged.

4) Location of dredging (e.g., estuaries, open coastal waters or streams).

5) The location of proposed spoil disposal.

6) The grain size distribution of spoils.

7) The occurrence of any pollutants in the dredge spoils.

g. If the project includes filling, identify the type of fill material to be used, including pilings or other structures, and specify the proposed location for the placement of the fill, the quantity to be used and the surface area to be covered.

h. If the project includes diking, identify on a map the location, size (length, top and base width, depth and elevation of the proposed dike(s)) as well as the location, size and invert elevation of any existing or proposed culverts or tide gates.

i. If the project is adjacent to a wetland and may cause mud waves, a report shall be prepared by a qualified geotechnical engineer which explains ways to prevent or mitigate the problem.

j. Benchmark and survey data used to locate the project, the lines of highest tidal action, mean high tide, or other reference points applicable to the particular project.

k. Other governmental approvals required and obtained. Indicate the public notice number of Army Corps of Engineers permit if applicable.

Any maps or technical data submitted by the applicant will be subject to review by the State Department of Fish and Game, the State Lands Commission, or other applicable agencies who may submit comments to the Commission.

IV. DEVELOPMENTS PERMITTED IN WETLANDS AND ESTUARIES

Of all the environmentally sensitive habitat areas mentioned specifically in the Coastal Act, wetlands and estuaries are afforded the most stringent protection. In order to approve a project involving the diking, filling[1], or dredging of a wetland or estuary, the Commission must first find that the project is one of the specific, enumerated uses set forth in Section 30233 of the Act (these developments and activities are listed in section A. and B. below). The Commission must then find that the project meets all three requirements of Section 30233 of the Act (see pp. 14-17). In addition, permitted development in these areas must meet the requirements of other applicable provisions of the Coastal Act.

A. Developments and Activities Permitted in Wetlands and Estuaries

1. Port facilities.

2. Energy facilities.

[1] The Coastal Act defines "fill" as ". . . earth or any other substances or material, including pilings placed for the purposes of erecting structures thereon, placed in a submerged area" (Section 30108.2).

3. Coastal-dependent industrial facilities[2], such as commercial fishing facilities.

4. Maintenance of existing or restoration of previously dredged depths in navigation channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

5. Incidental public service purposes which temporarily impact the resources of the area, which include, but are not limited to, burying cables and pipes, inspection of piers, and maintenance of existing intake and outfall lines (roads do not qualify)[3].

6. Restoration projects.[4]

(continued on next page)

[2] For the purposes of this guideline, a coastal-dependent industrial facility is one which requires a site on, or adjacent to, the sea to function. See also Sections 30260 through 30264.

[3] When no other alternative exists, and when consistent with the other provisions of this section, limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted. Activities described in the Commission's Guideline on Exclusions from Permit Requirements applicable to roads also should be consulted.

[4] Restoration projects allowable under Section 30233 are discussed in detail on pp. 13-14.

7. Nature study, aquaculture,[5] or similar resource-dependent activities[6]

8. In wetland areas, only entrance channels for new or expanded boating facilities[7] may be constructed, except that in a degraded wetland,[8] other boating facilities may be permitted according to the requirements of Section 30411 discussed on pp. 23-27.

9. New or expanded boating facilities in estuaries. [9]

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[5] Aquaculture is not defined in the Coastal Act. The definition contained in Public Resources Code, Division 1, Chapter 4, Section 828 will be used for the purposes of this guideline. ". . . 'aquaculture' means the culture and husbandry of aquatic organisms, including, but not limited to, fish, shellfish, mollusks, crustaceans, kelp and algae. Aquaculture shall not mean the culture and husbandry of commercially utilized inland crops, including, but not limited to, rice, watercress, and bean sprouts." Aquaculture activities could only be sited in a wetland or estuary if they depended upon the resources of the wetland or estuary to be able to function at all. Support facilities which could be located on upland sites (e.g., parking lots, buildings) would not be permitted in the wetland or estuary. This requirement is not intended to discourage aquaculture projects or to prohibit vertical access. The Coastal Act encourages aquaculture.

[6] For the purposes of this guideline, similar resource-dependent activities include scientific research, hunting and fishing (where otherwise permitted). In addition, when wetlands are seasonally farmed, the continued use of agriculture is allowed. Expanding farming operations into non-farmed wetlands by diking or otherwise altering the functional capacity of the wetland is not permitted. Farm-related structures (including barns, sheds, and farm-owner occupied housing) necessary for the continuance of the existing operation of the farmed wetlands may be located on an existing farmed wetland parcel, only if no alternative upland location is available for such purpose and the structures are sited and designed to minimize the adverse environmental effects on the farmed wetland. Clustering and other construction techniques to minimize both the land area covered by such structures and the amount of fill necessary to protect such structures will be required.

[7] Boating facilities include, but are not limited to, boat landings, boat launching ramps, and marinas.

[8] The term "degraded wetland" (emphasis added) is discussed on pp. 24-25.

[9] The list of developments permitted in wetlands and estuaries is the same except that new or expanded boating facilities are permitted in estuaries but are not permitted in wetlands.

B. Special Limitations on Development in Those Coastal Wetlands Identified by the Department of Fish and Game

Pursuant to Section 30233(c) of the Act, the type and amount of development in the coastal wetlands identified by the Department of Fish and Game is even more limited than those developments set forth in section A. above.

Not all coastal wetlands are identified by the Department of Fish and Game; rather, only 19 are identified for acquisition purposes in their report, "Acquisition Priorities for the Coastal Wetlands of California." However, the Department of Fish and Game may identify additional coastal wetlands pursuant to Section 30233(c). If the Department elects to identify additional wetlands pursuant to Section 30233(c), the Commission recommends that the Department develop standards and procedures for doing so. Wetlands not identified by the Department of Fish and Game are still protected by the Coastal Act, because development in any wetland as defined in the Coastal Act (see section II A., above) must meet the requirements of Section 30233 and other applicable sections of the Act. The coastal wetlands identified for acquisition purposes to date are as follows:

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. Carpenteria 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

Development permitted in the wetland portions of those areas named above is limited to the following:

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 footnote #3).

2. Wetland restoration.

3. Nature study.

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.

C. Restoration Projects Permitted in Section 30233

Restoration projects which are a permitted development in Section 30233 (a)(7) are publicly or privately financed projects in which restoration is the sole purpose of the project. The Commission found in its decision on the Chula Vista LCP that projects which provide mitigation for non- permitted development may not be broadly construed to be restoration projects in order to avoid the strict limitations of permitted uses in Section 30233.

Restoration projects may include some fill for non-permitted uses if the wetlands are small, extremely isolated and incapable of being restored. This limited exception to Section 30233 is based on the Commission's growing experience with wetlands restoration. Small extremely isolated wetland parcels that are incapable of being restored to biologically productive systems may be filled and developed for uses not ordinarily allowed only if such actions establish stable and logical boundaries between urban and wetland areas and if the applicant provides funds sufficient to accomplish an approved restoration program in the same general region. All the following criteria must be satisfied before this exception is granted:

1. The wetland to be filled is so small (e.g., less than 1 acre) and so isolated (i.e., not contiguous or adjacent to a larger wetland) that it is not capable of recovering and maintaining a high level of biological productivity without major restoration activities.

2. The wetland must not provide significant habitat value to wetland fish and wildlife species, and must not be used by any species which is rare or endangered. (For example, such a parcel would usually be completely surrounded by commercial, residential, or industrial development which are incompatible with the existence of the wetland as a significant habitat area).

3. Restoration of another wetland to mitigate for fill can most feasibly be achieved in conjunction with filling a small wetland.

4. Restoration of a parcel to mitigate for the fill (see pp. 14-17 for details about required mitigation) must occur at a site which is next to a larger, contiguous wetland area providing significant habitat value to fish and wildlife which would benefit from the addition of more area. In addition, such restoration must occur in the same general region (e.g., within the general area surrounding the same stream, lake or estuary where the fill occurred).

5. The Department of Fish and Game and the U.S. Fish and Wildlife Service have determined that the proposed restoration project can be successfully carried out.

Additional flexibility will be allowed for restoration projects located in wetlands which are degraded (as that term is used in Section 30411 of the Coastal Act). Section VIII discusses the requirements of such projects.

D. Requirements for All Permitted Development

Any proposed project which is a permitted development must also meet the three statutory requirements enumerated below, in the sequence shown:

1. Diking, filling or dredging of a wetland or estuary will only be permitted if there is no feasible[10] less environmentally damaging alternative (Section 30233(a)). The Commission may require the applicant to submit any or all of the information described in section III. B. above.

2. If there is no feasible less environmentally damaging alternative, feasible mitigation measures must be provided to minimize adverse environmental effects.

   a. If the project involves dredging, mitigation measures must include at least the following (Section 30233(b)):

      1) Dredging and spoils disposal must be planned and carried out to avoid significant disruption[11] to wetland habitats and to water circulation.

      2) Limitations may be imposed on the timing of the operation, the type of operation, the quantity of dredged material removed, and the location of the spoil site.

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

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10 "Feasible" is defined in Section 30108 of the Act to mean "... capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." A feasible less environmentally damaging alternative may involve a location for the proposed development which is off the project site on lands not owned by the applicant. Feasible under the Coastal Act is not confined to economic considerations. Environmental, social and technological factors also shall be considered in any determination of feasibility.

11 To avoid significant disruption to wetland habitats and to water circulation the functional capacity of a wetland or estuary must be maintained. Functional capacity is discussed on page 17.

4) Other mitigation measures may include opening up areas to tidal action, removing dikes, improving tidal flushing, or other restoration measures.

The Executive Director or the Commission may request the Department of Fish and Game to review dredging plans for developments in or adjacent to wetlands or estuaries. The Department may recommend measures to mitigate disruptions to habitats or to water circulation.

b. If the project involves diking or filling of a wetland, required minimum mitigation measures are the following:[12]

1) If an appropriate restoration site is available, the applicant shall submit a detailed restoration plan which includes provisions for purchase and restoration of an equivalent area of equal or greater biological productivity[13] and dedication of the land to a public agency or otherwise permanently restricts its use for open space purposes. The site shall be purchased before the dike or fill development may proceed.

2) The applicant may, in some cases, be permitted to open equivalent areas to tidal action[14] or provide other sources of surface water. This method of mitigation would be appropriate if the applicant already owned filled, diked areas which themselves were not environmentally sensitive habitat areas but would become so, if such areas were opened to tidal action or provided with other sources of surface water.

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[12] Mitigation measures shall not be required for temporary or short-term fill or diking, if and only if a bond or other evidence of financial responsibility is provided to assure that restoration will be accomplished in the shortest feasible time. For the purposes of this guideline, short-term generally means that the fill or dikes would be removed immediately upon completion of the construction of the project necessitating the short-term fill or diking (Section 30607.1).

[13] For an area to be of "equal or greater biological productivity," it must provide equivalent or greater habitat values to the same type and variety of plant and animal species which use the area affected by the proposal.

[14] "Opening up equivalent areas to tidal action" means to permanently open to tidal action former intertidal wetlands capable of providing equal or greater biological productivity. Mitigation measures should restore areas which are no longer functioning in a manner beneficial to wetland species. For example, returning a diked-off, formerly saltwater, but presently freshwater marsh to tidal action would not constitute mitigation. However, improving tidal flushing by removing tide gates, digging tidal channels and clearing culverts might qualify, if the Commission determines that such actions would restore an area to equal or greater habitat value than the area lost.

3) However, if no appropriate restoration sites under options 1 and 2 are available, the applicant shall pay an in-lieu fee of sufficient value to an appropriate public agency for the purchase and restoration of an area of equivalent productive value, or equivalent surface area.

This third option would be allowed only if the applicant is unable to find a willing seller of a potential restoration site. The public agency may also face difficulties in acquiring appropriate sites even though it has the ability to condemn property. Thus, the in-lieu fee shall reflect the additional costs of acquisition, including litigation, as well as the cost of restoration. If the public agency's restoration project is not already approved by the Commission, the public agency may need to be a co-applicant for a coastal development permit to provide adequate assurance that conditions can be imposed to assure that the purchase of the mitigation site shall occur prior to issuance of the permit. In addition, such restoration must occur in the same general region (e.g., within the same stream, lake, or estuary where the fill occurred).

A preferred restoration program would remove fill from a formerly productive wetland or estuary which is now biologically unproductive dry land and would establish a tidal prism necessary to assure adequate flushing. Few if any restoration projects have been implemented for a sufficient length of time to provide much guidance as to the long-term restorability of such areas. Since such projects necessarily involve many uncertainties, restoration should preceed the diking or filling project. At a minumum, the permit will be conditioned to assure that restoration will occur simultaneously with project construction. Restoration and management plans shall be submitted with the permit application.

The restoration plan should generally state when restoration work will commence and terminate, should include detailed diagrams drawn to scale showing any alterations to natural landforms, and should include a list of plant species to be used as well as the method of plant introduction (i.e., seeding, natural succession, vegetative transplanting, etc.).

The management plan would constitute an agreement between the applicant and the Commission to guarantee the wetland is restored to the extent established under stated management objectives and within a specified time frame.

The plan should describe the applicant's responsibilities in maintaining the restored area to assure the Commission that the project will be successful. The management plan should generally include provisions for a monitoring program and for making any necessary repairs or modifications to the mitigation site

The applicant should periodically submit reports on the project which give information on the following:

- distribution and type of vegetation established
- benthic invertebrate abundance
- bird useage and establishment of endangered species
- fish and other vertebrate abundance

3. Diking, filling or dredging of a wetland or estuary must maintain or enhance the funtional capacity of the wetland or estuary [Section 30233(c)]. Functional capacity means the ability of the wetland or estuary to be self-sustaining and to maintain natural species diversity[15]. In order to establish that the functional capacity is being maintained, the applicant must demonstrate all of the following:

a. That the project does not alter presently occurring plant and animal populations in the ecosystem in a manner that would impair the long-term stability of the ecosystem; i.e., natural species diversity, abundance and composition are essentially unchanged as a result of the project.

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 or habitat that is essential to the natural biological functioning of the wetland or estuary.

d. That the project does not significantly reduce consumptive (e.g., fishing, aquaculture and hunting) or nonconsumptive (e.g., water quality and research opportunity) values of the wetland or estuarine ecosystem.

[15] The intention here is to convey the importance of not only how many species there are but also the size of their populations (abundance) and the relative importance of the different species to the whole system (composition). It cannot be overemphasized that the presence of a species by itself is an inadequate indicator of the condition of a natural system. In a "healthy" wetland ecosystem, the absolute number of individuals of a species and the relative number compared to other species will depend on the size of the organism and its place in the food web (what it feeds on, what feeds on it, and what competes with it for the same food or other resources). Major changes in absolute or relative numbers of some species will have far-reaching consequences for the whole ecosystem because of their interactions with other species.

E. Provisions Applicable to Proposed Development in Wetlands and Estuaries Within Port Jurisdictions

Development within those portions of the Ports of Hueneme, Long Beach, Los Angeles, and San Diego Unified Port District lying within the coastal zone is generally governed by the provisions contained in Chapter 8 of the Coastal Act. However, wetlands and estuaries which have been identified on the Commission's Port Jurisdiction Maps (adopted by the Commission on April 6, 1977 pursuant to Section 30710) are not governed by the provisions of Chapter 8, but instead are subject to Chapter 3 policies of the Coastal Act as described above in this section (Section 30700).

Chapter 8 treats all other "water areas" (term used in this Chapter only) without regard to whether such areas may be considered "wetland," "estuary" or "open coastal waters" as described in this guideline.

The diking, filling or dredging of any water area within one of these ports is limited by the following sections of the Coastal Act: 30705, 30706 and 30708 (these sections are provided in full in Appendix A). The diking, filling or dredging of any wetlands or estuaries lying within any port or harbor district or authority not named in Chapter 8 (e.g., Humboldt Bay Harbor, Recreation and Conservation District and Moss Landing Harbor District) is subject to Chapter 3 policies of the Coastal Act as described above in this section.

V. DEVELOPMENTS PERMITTED IN OPEN COASTAL WATERS AND LAKES

Section 30233 lists the types of developments for which diking, filling or dredging may be permitted in open coastal waters and lakes. This Section also states requirements for determining when those developments are permitted. The types of development identified below are the only ones that are permitted in open coastal waters and lakes, and may only be permitted if consistent with the development requirements for these habitat areas.

A. Developments and Activities Permitted in Open Coastal Waters and Lakes

1. All developments allowed in wetlands and estuaries described as Items 1-7 (section IV. A).

2. New or expanded boating facilities.

3. In portions of open coastal waters that are not environmentally sensitive habitat areas,[16] sand or gravel may be extracted.

[16] It shall be the responsibility of the permit applicant to provide evidence that the area is not an environmentally sensitive habitat area. The Executive Director or the Commission will usually require an applicant for a permit to extract minerals from open coastal waters to submit supplemental information.

B. Requirements for All Permitted Developments

Any proposed project which first is a permitted development as listed above must also meet the two statutory requirements enumerated below in the sequence shown.

1. Diking, filling or dredging of open coastal waters or lakes will only be permitted if there is no feasible less environmentally damaging alternative (Section 30233(a)).

2. If there is no feasible less environmentally damaging alternative, feasible mitigation measures must be provided to minimize adverse environmental effects (Section 30233(a)).

VI. DEVELOPMENTS PERMITTED IN STREAMS AND RIVERS

Sections 30236 and 30233 of the Coastal Act list all permitted developments in streams and rivers, including dams, channelizations, or other substantial alterations[17].

A. Permitted Developments in Streams and Rivers

1. Necessary water supply projects.

2. Flood control projects.

3. Developments where the primary function is the improvement of fish and wildlife habitat.

4. New or expanded boating facilities.

B. Requirements for All Development

Any proposed project which is a permitted development must also meet the following statutory requirements:

1. All channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible to minimize adverse environmental effects.

[17] Substantial alterations shall include channelizations, dams, or comparable projects which significantly disrupt the habitat value of a particular river or stream. A development which does not significantly disrupt the habitat value of a particular river or stream is one which maintains or enhances the functional capacity of that river or stream. Roads and bridges necessary to cross streams and rivers may be permitted if there is no feasible less environmentally damaging alternative and if feasible mitigation measures have been provided to minimize adverse environmental effects.

2. Flood control projects shall be subject to both of the following conditions (Section 30236):

a. The project must be necessary for public safety or to protect existing development.

b. There must be no other feasible method for protecting existing structures in the floodplain.

3. Boating facilities constructed in streams are subject to the same requirements as boating facilities constructed elsewhere.

VII. STANDARDS FOR SITING DEVELOPMENT ADJACENT TO ENVIRONMENTALLY SENSITIVE HABITAT AREAS

The general policies for development adjacent[18] to environmentally sensitive habitat areas appear in Section 30240(b) of the Coastal Act:

> "Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas." (emphasis added)

A. Criteria for Reviewing Proposed Development Adjacent to Environmentally Sensitive Habitat Areas

As with development located in environmentally sensitive habitat areas, the key standard for evaluating development adjacent to such areas is the extent to which the proposed development maintains the functional capacity of such areas (the standards to evaluate whether the functional capacity is being maintained are located on page 17). A development which does not significantly degrade an environmentally sensitive habitat area will maintain the functional capacity of that area. The type of proposed development, the particulars of its design, location in relation to the habitat area, and other relevant factors all affect the determination of functional capacity.

[18] Adjacent means situated near or next to, adjoining, abutting or juxtaposed to an environmentally sensitive habitat area. This will usually mean that any development proposed in an undeveloped area within a distance of up to 500 feet from an environmentally sensitive habitat area will be considered to be adjacent to that habitat area. In developed areas factors such as the nature, location and extent of existing development will be taken into consideration.

Accordingly, the Commission may set limits and conditions to development adjacent to environmentally sensitive habitat areas based upon any or all of the following sections of the Coastal Act: 30230; 30231; 30233; 30236; and 30240. The Commission has required the following types of mitigation measures: setbacks; buffer strips; noise barriers; landscape plans; pervious surfacing with drainage control measures to direct storm run-off away from environmentally sensitive habitat areas; buffer areas in permanent open space; land dedication for erosion control; and wetland restoration, including off-site drainage improvements. This section only discusses the requiements for establishing the width of buffer areas. It does not discuss any other measures as noted above which may also be necessary and more appropriate to ensure that the development is compatible with the continuance of the habitat area.

B. Criteria for Establishing Buffer Areas

A buffer area provides essential open space between the development and the environmentally sensitive habitat area. The existance of this open space ensures that the type and scale of development proposed will not significantly degrade the habitat area (as required by Section 30240). Therefore, development allowed in a buffer area is limited to access paths, fences necessary to protect the habitat area, and similar uses which have either beneficial effects or at least no significant adverse effects on the environmentally sensitive habitat area. A buffer area is not itself a part of the environmentaly sensitive habitat area, but a "buffer" or "screen" that protects the habitat area from adverse environmental impacts caused by the development.

A buffer area should be established for each development adjacent to environmentally sensitive habitat areas based on the standards enumerated below. The width of a buffer area will vary depending upon the analysis. The buffer area should be a minimum of 100 feet for small projects on existing lots (such as one single family home or one commercial office building) unless the applicant can demonstrate that 100 feet is unnecessary to protect the resources of the habitat area. If the project involves substantial improvements or increased human impacts, such as a subdivision, a much wider buffer area should be required. For this reason the guideline does not recommend a uniform width. The appropriate width will vary with the analysis based upon the standards.

For a wetland, the buffer area should be measured from the landward edge of the wetland (Appendix D). For a stream or river, the buffer area should be measured landward from the landward edge of riparian vegetation or from the top edge of the bank (e.g., in channalized streams). Maps and supplemental information may be required to determine these boundaries. Standards for determining the appropriate width of the buffer area are as follows:

1. Biological significance of adjacent lands. Lands adjacent to a wetland, stream, or riparian habitat area vary in the degree to which they are functionally related to these habitat areas. That is, functional relationships may exist if species associated with such areas spend a significant portion of their life cycle on adjacent lands. The degree of significance would depend upon the habitat requirements of the species in the habitat area (e.g., nesting,

feeding, breeding or resting). This determination requires the expertise of an ecologist, wildlife biologist, ornithologist or botanist who is familiar with the particular type of habitat involved. Where a significant functional relationship exists, the land supporting this relationship should also be considered to be part of the environmentally sensitive habitat area, and the buffer area should be measured from the edge of these lands and be sufficiently wide to protect these functional relationships. Where no significant functional relationships exist, the buffer should be extended from the edge of the wetland, stream or riparian habitat (for example) which is adjacent to the proposed development (as opposed to the adjacent area which is significantly related ecologically).

2. Sensitivity of species to disturbance. The width of the buffer area should be based, in part, on the distance necessary to ensure that the most sensitive species of plants and animals will not be disturbed significantly by the permittted development. Such a determination should be based on the following:

a. Nesting, feeding, breeding, resting or other habitat requirements of both resident and migratory fish and wildlife species.

b. An assessment of the short-term and long-term adaptibility of various species to human disturbance.

3. Susceptibility of parcel to erosion. The width of the buffer area should be based, in part, on an assessment of the slope, soils, impervious surface coverage, runoff characteristics, and vegetative cover of the parcel and to what degree the development will change the potential for erosion. A sufficient buffer to allow for the interception of any additional material eroded as a result of the proposed development should be provided.

4. Use of natural topographic features to locate development. Hills and bluffs adjacent to environmentally sensitive habitat areas should be used, where feasible, to buffer habitat areas. Where otherwise permitted, development should be located on the sides of hills away from environmentally sensitive habitat areas. Similarly, bluff faces should not be developed, but should be included in the buffer area.

5. Use of existing cultural features to locate buffer zones. Cultural features, (e.g., roads and dikes) should be used, where feasible, to buffer habitat areas. Where feasible, development should be located on the side of roads, dikes, irrigation canals, flood control channels, etc., away from the environmentally sensitive habitat area.

6. Lot configuration and location of existing development. Where an existing subdivision or other development is largely built-out and the buildings are a uniform distance from a habitat area, at least that same distance will be required as a buffer area for any new development permitted. However, if that distance is less than 100 feet, additional mitigation measures (e.g., planting of native vegetation which grows locally) should be provided to ensure additional protection. Where development is proposed in an area which is largely undeveloped, the widest and most protective buffer area feasible should be required.

7. Type and scale of development proposed. The type and scale of the proposed development will, to a large degree, determine the size of the buffer area necessary to protect the environmentally sensitive habitat area. For example, due to domestic pets, human use and vandalism, residential developments may not be as compatible as light industrial developments adjacent to wetlands, and may therefore require wider buffer areas. However, such evaluations should be made on a case-by-case basis depending upon the resources involved, and the type and density of development on adjacent lands.

VIII. RESTORATION AND MAINTENANCE OF WETLAND HABITAT AREAS

Originally there were approximately 300,000 acres of coastal wetlands in California; now there are about 79,000 acres (excluding San Francisco Bay). In addition to those acres lost, many wetlands have been severely altered through filling and/or sedimentation. The Coastal Commission encourages public agencies and landowners to work towards restoration and enhancement of these altered wetlands.

Restoration of habitat areas is strongly encouraged in the Coastal Act. The Legislature found that the protection, maintenance, and, where feasible, enhancement and restoration of natural resources is a basic goal of the Act (Section 30001.5). Section 30230 requires that marine resources be maintained, enhanced, and restored where feasible; that special protection be given to areas and species of special biological or economic significance; and that uses of the marine environment be carried out in a manner that will sustain the biological productivity[19] of coastal waters and will maintain "healthy populations"[20] of all species of marine organisms. Section 30231 requires that the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain "optimum populations"[21] of marine organisms

[19] In general, biological productivity means the amount of organic material produced per unit time. For the purposes of this guideline, the concept of biological productivity also includes the degree to which a particular habitat area is being used by fish and wildlife species. Thus, an area supporting more species of fish and wildlife would be considered more productive than an area supporting fewer species, all other factors (e.g., the amount of vegetative cover, the presence or absence of endangered species, etc.) being equal.

[20&21] These phrases refer generally to the maintenance of natural species diversity, abundance, and compositon.

be maintained and where feasible restored, through, among other means, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section IV C previously discussed "restoration purposes," a permitted use in Section 30233(a)(7). Projects which qualify for consideration as a "restoration purpose" will be solely restoration projects, including only those permitted uses listed in Section 30233(a). Such projects may be carried out on wetlands which have not been determined to be degraded by the Department of Fish and Game. It is anticipated that public or private agencies performing restoration of wetland habitat areas by restoring tidal action, removing fill, establishing appropriate contours, and performing other similar activities will be permitted under Section 30233.

This section discusses a second alternative approach to wetland restoration, applicable only to wetlands formally determined by the Department of Fish and Game to be degraded and in need of major restoration activities, according to the procedures and requirements of Section 30411. By including Section 30411 in the Coastal Act, the Legislature provided the Commission and the Department with a means to encourage landowners and public agencies to develop restoration projects which can be implemented with public or pricate funds. Restoration projects under this approach may include uses that are not permitted in Section 30233 if the project meets all of the other requirements of Section 30233 and 30411.

The Commission has closely examined the relationship of the two alternative approaches to restoration. The Coastal Act expressly distinguishes degraded from non-degraded wetlands. The importance of the distinction is related to the flexibility in consideration of permitted uses. Thus, Section 30233 allows the Commission to consider seven enumerated permitted uses in all wetlands without the mandatory involvement of the Department of Fish and Game. Section 30233 expressly allows only one additional use, a boating facility, in wetlands which the Department has determined to be degraded and in need of major restoration. In making this determination, the Department must consider all "feasible ways" other than a boating facility to accomplish restoration of degraded wetlands. The Commission interprets the boating facilities reference in Section 30233(a)(3) to include the "other feasible ways" of restoration which the Department must consider in Section 30411(b)(3). The remainder of this Section addresses the requirements of Section 30411.

A. Identification of Degraded Wetlands

The Department of Fish and Game must identify degraded wetlands. Generally, coastal wetlands are considered degraded if they were formerly tidal but their present resource value has been greatly impaired because they are presently diked or otherwise modified and, as a result, tidal influence has ceased or is greatly diminished. The Department has not yet transmitted to the Commission its criteria or procedures for identifying degraded wetlands, but the Commission considers the following factors relevant to determining whether or not a particular wetland is degraded.

1. Amount and elevation of filled areas.

2. Number and location of dikes and other artificial impediments to tidal action and freshwater flow and the ease of removing them to allow tidal action to resume.

3. Degree of topographic alterations to the wetland and associated areas.

4. Water quality.

5. Substrate quality.

6. Degree of encroachment from adjacent urban land uses.

7. Comparison of historical environmental conditions with current conditions, including changes in both the physical and biological environment.

8. Consideration of current altered wetland conditions and their current contribution to coastal wetland wildlife resources with relation to potential restoration measures.

9. Chemical cycling capabilities of the wetland including water quality enhancement, nutrient accumulation, nutrient recycling, etc.

As part of this identification process, the extent of wetlands on the site must be identified with precision.

B. Requirements Applicable to All Restoration Projects

Under the Act, the Department of Fish and Game, in consultation with the Commission and the Department of Boating and Waterways, is responsible for identifying those degraded wetlands which can most feasibly be restored in (a). If the Department undertakes a study, it shall include facts supporting the following determinations:

(1) The wetland is so severely degraded and its natural processes are so substantially impaired that it is not capable of recovering and maintaining a high level of biological productivity without major restoration activities.

(2) Restoration of the wetlands' natural values, including its biological productivity and wildlife habitat features, can most feasibly achieved and maintained in conjunction with a boating facility.

(3) There are no other feasible ways[22] besides a boating facility to restore the wetland.

[22] "Other feasible ways" includes only less environmentally damaging alternative restoration projects; but may include uses not permitted in Section 30233(a)(3) according to priorities discussed herein.

C. Requirements applicable to Restoration of Degraded Wetlands in Conjunction with boating Facilities

Section 30411 explicitly provides for the construction of boating facilities when this is the most feasible and least environmentally damaging means to restore a particular degraded wetland. Recognition of boating facilities as a use in Section 30411 is consistent with the Coastal Act's emphasis on promoting recreational use of the shoreline (see Section 30224). The specific requirements for boating facilities are discussed in overlapping portions of Sections 30233 and 30411 as follows:

1. At least 75% of the degraded wetland area should be restored and maintained as a highly productive wetland in conjunction with the boating facilities project (Section 30411(b)(2)).

2. The size of the wetland area used for the boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, cannot be greater than 25 percent of the total area to be restored (Section 30233(a)(3)).

D. Requirements Applicable to Restoration of Degraded Wetlands Using Projects Other Than Boating Facilities

Section 30411 does not explicitly identify the other types of restoration projects. However, such projects are encouraged if they promote the restoration of degraded areas and if boating facilities are not feasible. An example would include flood control projects undertaken by a public agency. Such projects may be permitted under Section 30411 if they restore channel depths, are designed to enhance the functional capacity of the wetland area, and are the least environmentally damaging alternative to achieve restoration.

Boating facilities may be compatible with a wetland ecologically if they provide increased tidal flushing and deep-water habitat, but nonetheless it may not be physically or economically feasible to locate such facilities in a particular wetland. On the other hand, boating facilities may be feasible, but may be more environmentally damaging than other feasible means. For example, they may displace scarce intertidal habitats, introduce toxic substances, or damage natural estuarine channels by causing excessive scouring due to increased current velocities.

According to Section 30411, at least 75 percent of a degraded wetland area must be restored in conjunction with a boating facility, and Section 30233 requires that a boating facility cannot exceed 25 percent of the wetland area to be restored. However, this may still result in the net loss of 20 percent of the wetland area. The Coastal Act allows this tradeoff because additional boating facilities in the coastal zone are a preferred coastal recreation use and the Coastal Act explicitly provides for this type of wetland restoration project. Projects permitted under Section 30411 other than boating facilities should result in no net loss of the acreage of wetland habitat located on the site as a minimum. However, projects which result in a net increase in wetland habitat areas are greatly preferred in light of Coastal Act policies on wetland restoration and Senate Concurrent Resolution 29 which calls for an increase in wetlands by 50% over the next 20 years. For example, it has been the

Commission's experience in reviewing vegetation and soils information available for degraded wetlands in Southern California that sometimes wetland and upland sites are intermixed on a parcel. Since Section 30411 discusses percentage of wetland area as the standard of review for required restoration, the Commission will consider restoration plans which consolidate the upland and wetland portions on a site in order to restore a wetland area the same size or larger as the total number of acres of degraded wetland existing on the site.

The first priority for restoration projects is restoration as permitted under Section 30233(a)(7). Other preferred options include restoration in conjunction with visitor serving commercial recreational facilities designed to increase public opportunities for coastal recreation. Thus, the priority for projects used to restore degraded wetlands under the Coastal Act in a list are as follows:

1. "Restoration purposes" under 30233(a)(7).

2. Boating facilities, if they meet all of the tests of section C. (above).

3. Visitor serving commercial recreational facilities and other priority uses designed to enhance public opportunities for coastal recreation.

4. Private residential, general industrial, or general commercial development.

The Coastal Act does not require the Department of Fish and Game to undertake studies which would set the process described in this section in motion. Likewise, the Commission has the independent authority and obligation under Section 30233 to approve, condition or deny projects which the Department may have recommended as appropriate under the requirements of Section 30411. This section is, however, included to describe, clarify, and encourage, public and private agencies to formulate innovative restoration projects to accomplish the legislative goals and objectives described earlier.

Adopted February 4, 1981

APPENDIX A. APPLICABLE COASTAL ACT POLICIES

I. Coastal Act Definitions

Section

30101. "Coastal-dependent development or use"
30106. "Development"
30107. "Energy facility"
30107.5 "Environmentally sensitive area"
30108. "Feasible"
30108.2 "Fill"
30121. "Wetland"

SEC. 30101.

"Coastal-dependent development or use" means any development or use which requires a site on, or adjacent to, the sea to be able to function at all.

SEC. 30106.

"Development" means, on land, in or under water, the placement or erection of any solid material or structure; discharge or disposal of any dredged material or of any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land, including, but not limited to, subdivision pursuant to the Subdivision Map Act (commencing with Section 66410 of the Government Code), and any other division of land, including lot splits, except where the land division is brought about in connection with the purchase of such land by a public agency for public recreational use; change in the intensity of use of water, or of access thereto; construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes, kelp harvesting, and timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 (commencing with Section 4511).

As used in this section, "structure" includes, but is not limited to, any building, road, pipe, flume, conduit, siphon, aqueduct, telephone line, and electrical power transmission and distribution

SEC. 30107.

"Energy facility" means any public or private processing, producing, generating, storing, transmitting, or recovering facility for electricity, natural gas, petroleum, coal, or other source of energy.

SEC. 30107.5

"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

SEC. 30108.

"Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

SEC. 30108.2.

"Fill" means earth or any other substance or material, including pilings placed for the purposes of erecting structures thereon, placed in a submerged area.

SEC. 30121

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

II. Coastal Act Policies for the Location of New Boating Facilities

Section

30244. Recreational boating use; encouragement; facilities.

SEC. 30224.

Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.

III. Coastal Act Policies for Water and Marine Resources and Environmentally Sensitive Habitat Areas

Section

30230. Marine resources; maintenance.
30231. Biological productivity; waste water.
30233. Diking, filling or dredging.
30236. Water supply and flood control.
30240. Environmentally sensitive habitat areas; adjacent development.

SEC. 30230.

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

SEC. 30231.

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

SEC. 30233.

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

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

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland; provided, however, that in no event shall the size of the wetland area used for such boating facility, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, be greater than 25 percent of the total wetland area to be restored.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities.

(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.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that no less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay, shall be designed and used for commercial fishing activities.

SEC. 30236.

Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

III. (cont.)

SEC. 30240.

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

SEC. 30255.

Coastal-dependent developments shall have priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support. (Amended by Cal. Stats. 1979, Ch. 1090.)

SEC. 30607.1.

Where any dike and fill development is permitted in wetlands in conformity with this division, mitigation measures shall include, at a minimum, either acquisition of equivalent areas of equal or greater biological productivity or opening up equivalent areas to tidal action; provided, however, that if no appropriate restoration site is available, an in-lieu fee sufficient to provide an area of equivalent productive value or surface areas shall be dedicated to an appropriate public agency, or such replacement site shall be purchased before the dike or fill development may proceed. Such mitigation measures shall not be required for temporary or short-term fill or diking; provided, that a bond or other evidence of financial responsibility is provided to assure that restoration will be accomplished in the shortest feasible time.

IV. Coastal Act Policies for Wetland Management Programs Involving Other State Agencies

Section

30411. Department of Fish and Game; Fish and Game Commission; management programs; wetlands.

SEC. 30411.

(a) The Department of Fish and Game and the Fish and Game Commission are the principal state agencies responsible for the establishment and control of wildlife and fishery management programs and neither the commission nor any regional commission shall establish or impose any controls with respect thereto that duplicate or exceed regulatory controls established by such agencies pursuant to specific statutory requirements or authorization.

(b) The Department of Fish and Game, in consultation with the commission and the Department of Navigation and Ocean Development, may study degraded wetlands and identify those which can most feasibly be restored in conjunction with development of a boating facility as provided in subdivision (a) of Section 30233. Any such study shall include consideration of all of the following:

(1) Whether the wetland is so severely degraded and its natural processes so substantially impaired that it is not capable of recovering and maintaining a high level of biological productivity without major restoration activities.

(2) Whether a substantial portion of the degraded wetland, but in no event less than 75 percent, can be restored and maintained as a highly productive wetland in conjunction with a boating facilities project.

(3) Whether restoration of the wetland's natural values, including its biological productivity and wildlife habitat features, can most feasibly be achieved and maintained in conjunction with a boating facility or whether there are other feasible ways to achieve such values.

IV. (cont.)

(c) The Legislature finds and declares that salt water or brackish water aquaculture is a coastal-dependent use which should be encouraged to augment food supplies and to further the policies set forth in Chapter 4 (commencing with Section 825) of Division 1. The Department of Fish and Game may identify coastal sites it deems appropriate for aquaculture facilities. Such sites shall be identified in conjunction with the appropriate local coastal program prepared pursuant to this division. The commission, and where appropriate, local governments shall, consistent with the coastal planning requirements of this division, provide for as many coastal sites identified by the Department of Fish and Game for such uses as are consistent with the policies of Chapter 3 (commencing with Section 30200) of this division.

V. Coastal Act Policies Governing Ports

Section

30700. Ports included.
30705. Diking, filling or dredging water areas.
30706. Fill.
30708. Location, design and construction of port related developments.
30710. Jurisdictional map of port.

SEC. 30700.

For purposes of this division, notwithstanding any other provisions of this division except as specifically stated in this chapter, this chapter shall govern those portions of the Ports of Hueneme, Long Beach, Los Angeles, and San Diego Unified Port District, located within the coastal zone excluding any wetland, estuary, or existing recreation area indicated in Part IV of the coastal plan, are contained within this chapter.

SEC. 30705.

(a) Water areas may be diked, filled, or dredged when consistent with a certified port master plan only for the following:

(1) Such construction, deepening, widening, lengthening, or maintenance of ship channel approaches, ship channels, turning basins, berthing areas, and facilities as are required for the safety and the accommodation of commerce and vessels to be served by port facilities.

(2) New or expanded facilities or waterfront land for port-related facilities.

(3) New or expanded commercial fishing facilities or recreational boating facilities.

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

(5) Mineral extraction, including sand for restoring beaches, except in biologically sensitive areas.

(6) Restoration purposes or creation of new habitat areas.

(7) Nature study, mariculture, or similar resource-dependent activities.

(8) Minor fill for improving shoreline appearance or public access to the water.

(b) The design and location of new or expanded facilities shall, to the extent practicable, take advantage of existing water depths, water circulation, siltation patterns, and means available to reduce controllable sedimentation so as to diminish the need for future dredging.

(c) Dredging shall be planned, scheduled, and carried out to minimize disruption to fish and bird breeding and migrations, marine habitats, and water circulation. Bottom sediments or sediment elutriate shall be analyzed for toxicants prior to dredging or mining, and where water quality standards are met, dredge spoils may be deposited in open coastal water sites designated to minimize potential adverse impacts on marine organisms, or in confined coastal waters designated as fill sites by the master plan where such spoil can be isolated and contained, or in fill basins on upland sites. Dredge material shall not be transported from coastal waters into estuarine or fresh water areas for disposal.

SEC. 30706.

In addition to the other provisions of this chapter, the policies contained in this section shall govern filling seaward of the mean high tide line within the jurisdiction of ports:

(a) The water area to be filled shall be the minimum necessary to achieve the purpose of the fill.

(b) The nature, location, and extent of any fill, including the disposal of dredge spoils within an area designated for fill, shall minimize harmful effects to coastal resources, such as water quality, fish or wildlife resources, recreational resources, or sand transport systems, and shall minimize reductions of the volume, surface area, or circulation of water.

(c) The fill is constructed in accordance with sound safety standards which will afford reasonable protection to persons and property against the hazards of unstable geologic or soil conditions or of flood or storm waters.

(d) The fill is consistent with navigational safety.

SEC. 30708.

All port-related developments shall be located, designed, and constructed so as to:

(a) Minimize substantial adverse environmental impacts.

(b) Minimize potential traffic conflicts between vessels.

(c) Give highest priority to the use of existing land space within harbors for port purposes, including, but not limited to, navigational facilities, shipping industries, and necessary support and access facilities.

(d) Provide for other beneficial uses consistent with the public trust, including, but not limited to, recreation and wildlife habitat uses, to the extent feasible.

(e) Encourage rail service to port areas and multicompany use of facilities.

V. (cont.)

SEC. 30710.

Within 90 days after January 1, 1977, the commission shall, after public hearing, adopt, certify, and file with each port governing body a map delineating the present legal geographical boundaries of each port's jurisdiction within the coastal zone. The Commission shall, within such 90-day period, adopt and certify after public hearing, a map delineating boundaries of any wetland, estuary, or existing recreation area indicated in Part IV of the coastal plan within the geographical boundaries of each port.

VI. Post-LCP Certification Permit and Appeal Jurisdiction

Section

30519. Termination of development review authority; exceptions
30603. Appeals after certification of local program; grounds; standard of review; finality of acts

SEC. 30519

(a) Except for appeals to the commission, as provided in Section 30603, after a local coastal program, or any portion thereof, has been certified and all implementing actions within the area affected have become effective, the development review authority provided for in Chapter 7 (commencing with Section 30600) shall no longer be exercised by the regional commission or by the commission where there is no regional commission over any new development proposed within the area to which such certified local coastal program, or any portion thereof, applies and shall at that time be delegated to the local government that is implementing such local coastal program or any portion thereof.

(b) Subdivision (a) shall not apply to any development proposed or undertaken on any tidelands, submerged lands, or on public trust lands, whether filled or unfilled, lying within the coastal zone, nor shall it apply to any development proposed or undertaken within ports covered by Chapter 8 (commencing with Section 30700) or within any state university or college within the coastal zone; however, this section shall apply to any development proposed or undertaken by a port or harbor district or authority on lands or waters granted by the Legislature to a local government whose certified local coastal program includes the specific development plans for such district or authority.

SEC. 30603.

(a) After certification of its local coastal program, an action taken by a local government on a coastal development permit application may be appealed to the commission for any of the following:

(1) Developments approved by the local government between the sea and the first public road paralleling the sea or within 300 feet of the inland extent of any beach or of the mean high tide line of the sea where there is no beach, whichever is the greater distance.

(2) Developments approved by the local government not included within paragraph (1) of this subdivision located on tidelands, submerged lands, public trust lands, within 100 feet of any wetland, estuary, stream, or within 300 feet of the top of the seaward face of any coastal bluff.

(3) Developments approved by the local government not included within paragraph (1) or (2) of this subdivision located in a sensitive coastal resource area if the allegation on appeal is that the development is not in conformity with the implementing actions of the certified local coastal program.

(4) Any development approved by a coastal county that is not designated as the principal permitted use under the zoning ordinance or zoning district map approved pursuant to Chapter 6 (commencing with Section 30500).

(5) Any development which constitutes a major public works project or a major energy facility.

(b) The grounds for an appeal pursuant to paragraph (1) of subdivision (a) shall be limited to the following:

(1) The development fails to provide adequate physical access or public or private commercial use or interferes with such uses.

(2) The development fails to protect public views from any public road or from a recreational area to, and along, the coast.

(3) The development is not compatible with the established physical scale of the area.

(4) The development may significantly alter existing natural landforms.

(5) The development does not comply with shoreline erosion and geologic setback requirements.

(c) The standard of review for any development reviewed pursuant to subdivision (a)(3) shall be in conformity with the implementing actions of the certified local coastal program.

Such action shall become final after the 10th working day, unless an appeal is filed within that time.

VII. Development Authorized Without a Coastal Development Permit

Section

30610. Development authorized without permit

SEC. 30610.

Notwithstanding any provision in this division to the contrary, no coastal development permit shall be required pursuant to this chapter for the following types of development and in the following areas:

(a) Improvements to existing single-family residences; provided, however, that the commission shall specify, by regulation, those classes of development which involve a risk of adverse environmental effect and shall require that a coastal development permit be obtained under this chapter.

(b) Improvements to any structure other than a single-family residence or a public works facility; provided, however, that the commission shall specify, by regulation, those types of improvements which (1) involve a risk of adverse environmental effect, (2) adversely affect public access, or (3) involve a change in use contrary to any policy of this division. Any improvement so specified by the commission shall require a coastal development permit.

~~(b)~~ (c) Maintenance dredging of existing navigation channels or moving dredged material from such channels to a disposal area outside the coastal zone, pursuant to a permit from the United States Army Corps of Engineers.

~~(c)~~(d) Repair or maintenance activities that do not result in an addition to, or enlargement or expansion of, the object of such repair or maintenance activities; provided, however, that if the commission determines that certain extraordinary methods of repair and maintenance that involve a risk of substantial adverse environmental impact, it shall, by regulation, require that a permit be obtained under this chapter.

~~(d)~~(e) Any category of development, or any category of development within a specifically defined geographic area, that the commission, after public hearing, and by two-thirds vote of its appointed members, has described or identified and with respect to which the commission has found that there is no potential for any significant adverse effect, either individually or cumulatively, on coastal resources or on public access to, or along, the coast and that such exclusion will not impair the ability of local government to prepare a local coastal program.

~~(e)~~(f) The installation, testing, and placement in service or the replacement of any necessary utility connection between an existing service facility and any development approved pursuant to this division; provided, that the commission may, where necessary, require reasonable conditions to mitigate any adverse impacts on coastal resources, including scenic resources.

(g) The replacement of any structure, other than a public works facility, destroyed by natural disaster. Such replacement structure shall conform to applicable existing zoning requirements, shall be for the same use as the destroyed structure, shall not exceed either the floor area, height, or bulk of the destroyed structure by more than 10 percent, and shall be sited in the same location on the affected property as the destroyed structure.

As used in this subdivision, "natural disaster" means any situation in which the force or forces which destroyed the structure to be replaced were beyond the control of its owner.

As used in this subdivision, "bulk" means total interior cubic volume as measured from the exterior surface of the structure. (Amended by Cal. Stats. 1979, Ch. 919.)

APPENDIX B. RESOURCE AGENCY WETLAND POLICY

[Issued on September 19, 1977 by Huey D. Johnson, Secretary for Resources]

Policy for the Preservation of Wetlands in Perpetuity

The need to raise thinking, and action to the ecosystem level is especially evident as it relates to proposed construction projects on wetlands of the state.

The value of marshlands and other wetlands to the economy and to the overall long term quality of life, has been described by many, including Gosselink, Odum, and Pope (1973) In "The Value of the Tidal Marsh"; the Bay Conservation and Development Commission (BCDC) in "The San Francisco Bay Plan"; and the Department of Fish and Game in "The Fish and Wildlife Plan." In spite of these and other efforts, filling and other destruction of the State's wetlands has continued at an alarming rate. Most of San Francisco Bay's wetlands are not protected by BCDC. But, before the Commission came into existance, over 225 square miles of Bay wetlands had been filled or destroyed. Still not all of the Bay's wetlands are protected. Over 40,000 acres are not in the Commission's jurisdiction.

Portions of other important wetlands still exist along the coast, its estuaries, the Sacramento-San Joaquin Delta, and along several natural bodies of water including Clear Lake, the Colorado River, and others. Many of these wetlands are not under permit authority and sometimes federal authority (Corps of Engineers) exists over specific projects and areas.

It is the purpose of this memorandum to establish a basic wetlands policy to be observed by all Departments, Boards, and Commissions of the Resources Agency when developing projects or when authorizing or influencing private or public projects and permit actions taken by other authorities including federal, state, and local agencies.

Resources Agency Basic Wetlands Protection Policy

It is the basic policy of the Resource Agency that this Agency and its Department, Boards and Commissions will not authorize or approve projects that fill or otherwise harm or destroy coastal, estuarine, or inland wetlands.

Exceptions to this policy may be granted provided that the following condition are met:

1. The proposed project must be water dependent or an essential transportation, water conveyance or utility project.

2. There must be no feasible, less environmentally damaging alternative location for the type of project being considered.

APPENDIX C. SUMMARY OF FEDERAL AND STATE REGULATORY INVOLVEMENT REGARDING DEVELOPMENT IN WETLANDS AND OTHER WET ENVIRONMENTALLY SENSITIVE HABITAT AREAS

Dredging, filling, or otherwise altering wetlands or associated habitat areas, including estuaries, lakes, streams or open coastal waters, is subject to the regulatory requirements of a number of federal and state agencies. In addition to any permits required by local governments, the Army Corps of Engineers (COE), the California Coastal Commission (CCC), the California State Department of Fish and Game (DFG), the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Board (RWQCB), and, in some instances, the State Lands Commission (SLC), have regulatory authority in such areas. The following is a discussion of the regulatory involvement of these and other agencies that issue or provide official comments on permits for alterations of wetlands and associated habitat areas. This is not meant to be an all-encompassing analysis of agencies' regulations, but an overview of those agencies that are involved in permit processes for these areas. This discussion is intended as an overview for general information. For further information regarding the specific responsibilities and duties of the agencies, please refer to the references that are cited in the discussion, or contact the agencies directly.

I. Federal Permits

Under Section 404 of the Clean Water Act of 1972, also called the Federal Water Pollution Control Act Amendments of 1972, and Section 10 of the Rivers and Harbors Act of 1899, the Army Corp of Engineers (COE) is the principal federal agency involved in regulating development in wetlands and associated habitat areas. A COE 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 (see COE publication "U.S. Army Corp of Engineers Permit Program, A Guide for Applicants," EP 1145-2-1, November 1, 1977). The COE has issued regulations for processing permits and has developed policies to protect wetlands (COE, "Permits for Activities in Navigable Waters," Federal Register, Vol. 40, No. 144, Part IV, July 25, 1975) (33 C.F.R. Parts 320-324). In general, the COE will only issue a permit for altering a wetland for water dependent activities, and only if such activities have mitigatible adverse environmental impacts (see also article by Lance Wood and John Hill "Wetlands Protection: The Regulatory Role of the U.S. Army Corps of Engineers," Coastal Zone Management Journal, Vol. 4, 1978, pp. 371-407). Furthermore, applicants for COE 404 and Section 10 permits must include in their application a certification of consistency with the California Coastal Management Program (see section II below).

Pursuant to Section 404 (b)(1) of the Clean Water Act of 1972, the U.S. Environmental Protection Agency (EPA) in conjunction with the COE has developed guidelines for regulating the discharge of dredged or fill material into waters of the U.S. (EPA, "Discharge of Dredged or Fill Material," Federal Register, Vol. 40, No. 173, Part II, September 5, 1975). These guidelines, which are currently being revised, provide the basis on which the COE acts in issuing Section 404 permits. ("Permits for Discharges of Dredged or Fill Material" 33 C.F.R. Part 323).

3. The public trust must not be adversely affected.

4. Adequate compensation for project-caused losses shall be a part of the project. Compensation, to be considered adequate, must meet the fololowing criteria:

a. The compensation measures must be in writing in the form of either conditions on a permit or an agreement signed by the applicant and the Department of Fish and Game or the Resources Agency.

b. The combined long-term "wetlands habitat value" of the lands involved (including project and mitigation lands) must not be less after project completion that the combined "wetlands habitat value" that exists under pre-project conditions.

The COE may override the guidelines if navigation or anchorage requires. Nevertheless, EPA may prohibit or restrict any discharges of dredged or fill material after public notice, opportunity for public hearing, and consultation with the COE, if such discharges might have an unacceptable adverse impact on a municipal water supply, wildlife, recreation area, or shellfish beds and fishery areas, including breeding and spawning grounds. EPA has issued a pamphlet "A Guide to the Dredge or Fill Program" which explains these regulations (issued July, 1979 by the Office of Water Planning and Standards WH585, Washington, D.C. 20460). EPA has also issued a statement to establish EPA policy to preserve wetland ecosystems and to protect them from destruction through waste water or nonpoint source discharges (EPA, "Protection of Nation's Wetlands Policy Statement," Federal Register, Vol. 30, No. 84, May 2, 1973) EPA Regulations, 40 C.F.R. Part 230).

In addition to EPA, a number of federal agencies, most importantly the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), strongly influence the COE permit process. Pursuant to the Clean Water Act of 1972 and the Fish and Wildlife Coordination Act, the FWS and the NMFS review and comment on permit applications to federal agencies, including COE Section 404 permits, to protect fish and wildlife resources and to mitigate project impacts (FWS, "Review of Fish and Wildlife Aspects of Proposals in or Affecting Navigable Waters," Federal Register, Vol. 40, No. 231, Part IV, December 1, 1975) (16 U.S.C. 662). The 1977 Amendments to the Clean Water Act particularly emphasize that the FWS review, comment, and provide technical assistance, primarily through the National Wetland Inventory. In response to the President's Water Policy Message of June 6, 1978 and the President's Water Policy Memorandum dated July 12, 1978, the Department of Commerce and the Department of Interior (of which the FWS is a part) have recently promulgated guidelines to standardize agency procedures and interagency relationships in the analysis of the impacts of federally-approved, water-related projects upon wildlife resources (Department of Interior, Department of Commerce "Fish and Wildlife Coordination Act; Notice of Proposed Rule-making," Federal Register, Vol. 44, No. 98, Part V, May 18, 1979). The FWS and the NMFS, in preparing comments, and the COE, in reviewing comments, also rely on the policy direction of the following federal statutes: the Endangered Species Act of 1973, the Marine Protection, Research, and Sanctuaries Act of 1972, the National Environmental Protection Act of 1969, the Estuary Protection Act, the Watershed Protection Act, and others.

Executive Order 11990 (Protection of Wetlands) and Executive Order 11988 (Floodplain Management) provide further guidance to federal agencies. The Department of Interior has issued interim guidelines for complying with these Orders (Department of Interior, "Protection Procedures Interim Guidelines," Federal Register, Vol. 43, No. 112, Part IV, June 7, 1978). By affecting the decisions of agencies within the Department of Interior, including the FWS, these guidelines further influence the COE permit process.

II. Federal-State Interaction

Pursuant to regulations adopted by the Office of Coastal Zone Management (OCZM) under the Federal Coastal Zone Management Act (CZMA), applicants for COE 404 and Section 10 permits must include in their application a certification of

consistency with the California Coastal Management Program. This certification, and accompanying data and analysis, must also be submitted to the Coastal Commission for review and concurrence. The federal agency may not issue the permit until the Commission reviews and concurs in the applicant's consistency certification. This requirement is in addition to those described in Section III, below, for coastal permits, although the standard of review will be substantially the same.

In addition, pursuant to the Fish and Wildlife Coordination Act, the COE must give full consideration to comments submitted by the California State Department of Fish and Game. As the principal state agency responsible for protecting fish, wildlife and other natural living resources, the DFG influences COE permit decisions in order to protect these resources. The DFG has drawn on the policy direction of the California Coastal Act of 1976, the California Endangered Species Act, the California Environmental Quality Act, and other state laws in making comments to the COE. The DFG has also relied consistently on the policy direction of the Resources Agency Wetland Policy issued by the Secretary for Resources, Huey Johnson, on September 19, 1977, which calls for the preservation of wetlands in perpetuity (see Appendix B for complete text).

III. State Permits

At the state level, the California Coastal Commission is the principal agency involved in regulating development in the coastal zone, including development in wetlands and associated habitat areas located in this zone. The California Coastal Act of 1976 is the law that guides the CCC in their regulatory decisions, generally actions on coastal development permits. Statewide interpretive guidelines promulgated by the CCC provide further guidance to the public and to permit applicants. Such guidelines describe the Coastal Act policies dealing with wetlands and associated habitat areas and explain how the Commission has previously interpreted relevant Coastal Act sections. In addition, the Commission takes under advisement the Resources Agency Basic Wetlands Protection Policy. The Commission also receives and considers comments from state and federal agencies, including the DFG and the FWS, and from other public and private groups; however, the final decision by the Commission must be based on the Coastal Act.

In addition to the review and comment role of the DFG on COE Section 404 and Section 10 permits and on CCC coastal development permits, the DFG regulates suction dredging and stream flow alterations, including wetland alterations, under Sections 1601 and 1603 of the Fish and Game Code. Although the document required under these sections of the law is not termed a permit, it is illegal if such an arrangement is not obtained before commencement of a project. Under Senate Concurrent Resolution No. 28 (September 13, 1979), the DFG has been requested to propose plans to protect, preserve, restore, acquire and manage wetlands. The findings and declarations of this Resolution and of Chapter 7, Section 5811 of the Public Resources Code, further guide the DFG in their regulatory and advisory responsibilities.

The State Water Resouces Control Board and the Regional Water Quality Control Boards issue several different permits that may be required in order to alter a wetland or associated habitat area. The SWRCB issues permits to appropriate water and water diversion permits; water quality must be protected in order for these to be issued. The RWQCB issues National Pollution Discharge Elimination System Elimination Discharge permits for any pollutant that might be discharged into navigable waters, and issues waste discharge permits for any development or operation affecting groundwater quality, including erosion from soil disturbances and drainage from agricultural operations. Both the SWRCB and the RWQCB may receive comments from federal and other state agencies.

The State Lands Commission becomes involved in the permitting process when a project is proposed on land that is owned by the State. The SLC reviews these projects for environmental assessment and considers the comments made by other agencies before issuing a permit, lease or other document.

IV. Summary

In summary, any development in the coastal zone in or affecting a wetland or associated habitat area will require permits or agreements from at least the following agencies:

1. U.S. Army Corps of Engineers Section 404 and Section 10 permits;

2. California Coastal Commission coastal development permit, and a Coastal Commission consistency certification concurrence or consistency determination;

3. California Department of Fish and Game 1601-1603 agreement;

4. State Water Resource Control Board (permit depends on the operation); and

5. Regional Water Quality Control Board (permit depends on the operation).

A permit from the California State Lands Commission may also be required.

The permit requirements for each agency are the result of federal or state statutes. Federal and state agencies interact in the issuance of permits by receiving and issuing comments. The decision to issue a permit by a particular agency can be either the sole responsibility of that agency (e.g., a SLC permit), or it can be a shared responsibility (e.g., a Section 404, which though issued by the COE, must be consistent with guidelines issued by EPA and FWS, and with the California Coastal Management Program).

APPENDIX D. TECHNICAL CRITERIA FOR IDENTIFYING AND MAPPING WETLANDS AND OTHER WET ENVIRONMENTALLY SENSITIVE HABITAT AREAS

The purpose of this discussion is to provide guidance in the practical application of the definition of "wetland" contained in the Coastal Act. The Coastal Act definition of "wetland" is set forth in Section 30121 of the Act which states:

> SEC. 30121
>
> "Wetland" means lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.

This is the definition upon which the Commission relies to identify "wetlands." The definition refers to lands ". . . which may be periodically or permanently covered with shallow water . . . ." However, due to highly variable environmental conditions along the length of the California coast, wetlands may include a variety of different types of habitat areas. For this reason, some wetlands may not be readily identifiable by simple means. In such cases, the Commission will also rely on the presence of hydrophytes and/or the presence of hydric soils. The rationale for this in general is that wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. For this reason, the single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water, and this is the feature used to describe wetlands in the Coastal Act. The water creates severe physiological problems for all plants and animals except those that are adapted for life in water or in saturated soil, and therefore only plants adapted to these wet conditions (hydrophytes) could thrive in these wet (hydric) soils. Thus, the presence or absence of hydrophytes and hydric soils make excellent physical parameters upon which to judge the existence of wetland habitat areas for the purposes of the Coastal Act, but they are not the sole criteria. In some cases, proper identification of wetlands will require the skills of a qualified professional.

The United States Fish and Wildlife Service has officially adopted a wetland classification system* which defines and classifies wetland habitats in these terms. Contained in the classification system are specific biological criteria for identifying wetlands and establishing their upland limits. Since the wetland definition used in the classification system is based upon a feature identical to that contained in the Coastal Act definitions, i.e., soil or substrate that is at least periodically saturated or covered by water, the Commission will use the

* "Classification of Wetlands and Deep-Water Habitats of the United States." By Lewis M. Cowardin, et al, United States Department of the Interior, Fish and Wildlife Service, December 1979.

classification system as a guide in wetland identification. Applying the same set of biological criteria consistently should help avoid confusion and assure certainty in the regulatory process. This appendix discusses the adapation of this classification system to the Coastal Act definition of "wetland" and other terms used in the Act, and will form the basis of the Commission's review of proposals to dike, fill or dredge wetlands, estuaries or other wet habitat areas.

I. U.S. Fish and Wildlife Classification System: Upland/Wetland/Deep-water Habitat Distinction

The United States Fish and Wildlife Service classification is hierarchical, progressing from systems and subsystems, at the most general levels, to classes, subclasses, and dominance types. The term "system" refers here to a complex of wetland and deep-water habitats that share the influence of one or more dominant hydrologic, geomorphologic, chemical, or biological factors.

The Service provides general definitions of wetland and deep-water habitat and designates the boundary between wetland and deep-water habitat and the upland limit of a wetland. The following are the Services' definitions of wetland and deep-water habitats:

A. Wetlands

> "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric 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.
>
> Wetlands as defined here include lands that are identified under other categories in some land-use classifications. For example, wetlands and farmlands are not necessarily exclusive. Many areas that we define as wetlands are farmed during dry periods, but if they are not tilled or planted to crops, a practice that destroys the natural vegetation, they will support hydrophytes.*

* For the purposes of identifying wetlands using the technical criteria contained in this guideline, one limited exception will be made. That is, drainage ditches as defined herein will not be considered wetlands under the Coastal Act. A drainage ditch shall be defined as a narrow (usually less than 5-feet wide), manmade nontidal ditch excavated from dry land.

Drained hydric soils that are now incapable of supporting hydrophytes because of a change in water regime are not considered wetlands by our definition. These drained hydric soils furnish a valuable record of historic wetlands, as well as an indication of areas that may be suitable for restoration.

The upland limit of wetland is designated as (1) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover; (2) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or (3) in the case of wetlands without vegetation or soil, the boundary between land that is flooded or saturated at some time each year and land that is not."

Wetlands should be identifed and mapped only after a site survey by a qualified botanist, ecologist, or a soil scientist (See section III. B. of the guideline for a list of required information)*.

B. Deepwater Habitats

"Deepwater habitats are permanently flooded lands lying below the deepwater boundary of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live, whether or not they are attached to the substrate. As in wetlands, the dominant plants are hydrophytes; however, the substrates are considered nonsoil because the water is too deep to support emergent vegetation (U. S. Soil Conservation Service, Soil Survey Staff 1975)."

* Further details regarding the standards and criteria for mapping wetlands using the Service's classification system may be found in the following, "Mapping Conventions of the National Wetland Inventory," (undated), published by the U.S.F.W.S. The document may be obtained from the U.S.F.W.S., Regional Wetland Coordinator, Region 1, Portland, Oregon.

"The boundary between wetland and deep-water habitat in the Marine and Estuarine Systems (i.e., areas subject to tidal influence) coincides with the elevation of the extreme low-water of spring tide (ELWS); permanently flooded areas are considered deep-water habitats in these systems. The boundary between wetland and deep-water habitat in the Riverine, Lacustrine and Palustrine Systems lies at a depth of 2m (6.6 ft.) below low-water; however, if emergents, shrubs or trees grow beyond this depth at any time, their deep-water edge is the boundary."

II. Wetland/Estuary/Open Coastal Water Distinction

For the purposes of mapping "wetlands" under the Coastal Act's definition of wetlands, and of mapping the other wet environmentally sensitive habitat areas referred to in the Act, including "estuaries," "streams," "riparian habitats," "lakes" and "open coastal water," certain adapations of this classification system will be made. The following is a discussion of these adaptations.

"Wetland," as defined in Section 30121 of the Coastal Act, refers to land covered by "shallow water," and the examples given in this section include fresh, salt and brackish water marshes, mudflats and fens. A distinction between "wetland" and the other habitat areas in the Act, for example, "estuary," must be made because the Act's policies apply differently to these areas, and because the Act does not define some of these terms (such as "estuary"). A reasonable distinction can be made between "wetland" and "estuary" on the basis of an interpretation of the phrase "shallow water." Using the service's classification system, "shallow water" would be water that is above the boundary of deep-water habitat, which would be the line of extreme low-water of spring tide* for areas subject to tidal influence and 2 meters for non-tidal areas. Therefore, wetland begins at extreme low-water of spring tide and "estuary" or "open coastal water" is anything deeper. The Coastal Act definition of "wetlands" would include the wetland areas of Estuarine, Palustrine, and Lacustrine ecological systems defined by the Fish and Wildlife classification system.

* While the Service's classification system uses "extreme low-water of spring tide" as the datum to distinguish between "shallow-water" and "deep-water habitat," such datum is not readily available for the California coast. Therefore, the lowest historic tide recorded on the nearest available tidal bench mark established by the U. S. National Ocean Survey should be used as the datum.

Data for such bench marks are published separately for each station in loose-leaf form by the National Ocean Survey, Tideland Water Levels, Datum and Information Branch, (C23), Riverdale, MD 20840. These compilations include the description of all bench marks at each tide station (for ready identification on the ground), and their elevations above the basic hydrographic or chart datum for the area, which is mean lower low-water on the Pacific coast. The date and length of the tidal series on which the bench-mark elevations are based are also given.

For the purposes of the Coastal Act, an "estuary" is a coastal water body usually semi-enclosed by land, but which has open, partially obstructed, or intermittent exchange with the open ocean and in which ocean water is at least occassionally diluted by fresh water runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation.

"Open coastal water" or "coastal water" as used in the Act refers to the open ocean overlying the continental shelf and its associated coastline with extensive wave action. Salinities exceed 30 parts per thousand with little or no dilution except opposite mouths of estuaries.

III. Wetland/Riparian Area Distinction

For the purpose of interpreting Coastal Act policies, another important distinction is between "wetland" and "riparian habitat." While the Service's classification system includes riparian areas as a kind of wetland, the intent of the Coastal Act was to distinguish these two areas. "Riparian habitat" in the Coastal Act refers to riparian vegetation and the animal species that require or utilize these plants. The geographic extent of a riparian habitat would be the extent of the riparian vegetation. As used in the Coastal Act, "riparian habitat" would include the "wetland" areas associated with Palustrine ecological systems as defined by the Fish and Wildlife Service classication system.

Unfortunately, a complete and universally acceptable definition of riparian vegetation has not yet been developed, so determining the geographic extent of such vegetation is rather difficult. The special case of determining consistent boundaries of riparian vegetation along watercourses throughout California is particularly difficult. In Southern California these boundaries are usually obvious; the riparian vegetation grows immediately adjacent to watercourses and only extends a short distance away from the watercourse. In Northern California, however, the boundaries are much less distinct; vegetation that occurs alongside a stream may also be found on hillsides and far away from a watercourse.

For the purposes of this guideline, riparian vegetation is defined as that association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other freshwater bodies. Riparian plant species and wetland plant species either require or tolerate a higher level of soil moisture than dryer upland vegetation, and are therefore generally considered hydrophytic. However, riparian vegetation may be distinguished from wetland vegetation by the different kinds of plant species. At the end of this appendix, lists are provided of some wetland hydrophytes and riparian hydrophytes. These lists are partial, but give a general indication of the representative plant species in these habitat areas and should be sufficient to generally distinguish between the two types of plant communities.

The upland limit of a riparian habitat, as with the upland limit of vegetated wetlands, is determined by the extent of vegetative cover. The upland limit of riparian habitat is where riparian hydrophytes are no longer predominant.

As with wetlands, riparian habitats should be identified and mapped only after a site survey by a qualified botanist, freshwater ecologist, or soil scientist.* (See pp. 6-9 of the guideline for a list of information which may be required of the applicant).

IV. Vernal Pools

Senate Bill No. 1699 (Wilson) was approved by the Governor on September 13, 1980 and the Bill added Section 30607.5 to the Public Resources Code to read:

> 30607.5. Within the City of San Diego, the commission shall not impose or adopt any requirements in conflict with the provisions of the plan for the protection of vernal pools approved and adopted by the City of San Diego on June 17, 1980, following consultation with state and federal agencies, and approved and adopted by the United States Army Corps of Engineers in coordination with the United States Fish and Wildlife Service.

The Commission shall adhere to Section 30607.5 of the Public Resources Code in all permit and planning matters involving vernal pools within the City of San Diego.

All vernal pools located within the city of San Diego in the coastal zone are depicted on a map attached as Exhibit 1 to a letter from Commission staff to Mr. James Gleason, City of San Diego (4/29/80). While "vernal pool" is a poorly defined regional term, all information available to the Commission suggests that all vernal pools in the coastal zone are located in the City of San Diego. It is important to point out, however, that vernal pools are distinct from vernal ponds and vernal lakes, which exist in other parts of the coastal zone (e.g. Oso Flaco Lakes in San Luis Obispo County). The Commission generally considers these habitat areas to be wetlands for the purposes of the Coastal Act, and therefore all applicable sections of the Coastal Act will be applied to these areas.

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* Identification of riparian habitat areas in Northern California presents peculiar difficulties. While in Southern California riparian vetetation generally occurs in a narrow band along streams and rivers, along the major rivers in Northern California it may be found in broad floodplains, abandoned river channels and the bottoms adjacent to the channels. In forested areas, the overstory of riparian vegetation may remain similar to the adjacent forest but the understory may contain a variety of plant species adapted to moist or wet substrates. For example, salmonberry, bayberry, willow, twinberry and lady fern, may all be more common in the understory of riparian habitat areas than in other types of forest habitat areas.

V. Representative Plant Species in Wetlands and Riparian Habitat Areas

This is a list of "representative" species that can be expected to be found in the various habitat areas indicated. Not all of them will be found in all areas of the State, and there are numerous others that could be included. However, this list should suffice to generally distinguish between these types of plant communities.

A. Salt Marsh

Pickleweed (Salicornia virginica)
Glasswort (S. subterminalis)
Saltgrass (Distichlis spicata)
Cordgrass (Spartina foliosa)
Jaumea (Jaumea carnosa)
Saltwort (Batis maritima)
Alkali heath (Frankenia grandifolia)
Salt cedar (Monanthochloe littoralis)
Arrow grass (Triglochin maritimum)
Sea-blite (Suaeda californica var pubescens)
Marsh rosemary (Limonium californicum var mexicanum)
Gum plant (Grindelia stricta)
Salt Marsh fleabane (Pluchea purpurescens)

B. Freshwater Marsh

Cattails (Typha spp.)
Bulrushes (Scirpus spp.)
Sedges (Carex spp.)
Rushes (Juncus spp.)
Spikerush (Heleochais palustris)
Pondweeds (Potamogeton spp.)
Smartweeds (Polygonum [illegible])
Water lilies (Nuphar spp.)
Buttercup (Ranunculus aquatilis)
Water-cress (Nasturtium officinale)
Bur-reed (Sparganium eurycarpum)
Water parsley (Venanthe sarmentosa)
Naiads (Na[illegible])

C. Brackish Marsh

Alkali bulrush (Scirpus robustus)
Rush (Juncus balticus)
Brass buttons (Cotula coronopifolia)
Fat-hen (Atriplex patula var hastata)
Olney's bulrush (Scirpus olneyi)
Common tule (Scirpus acutus)
Common reed (Phragmites communis)

D. Riparian

Willows (Salix spp.)
Cottonwoods (Populus spp.)
Red alder (Alnus rubra)
Box elder (Acer negundo)
Sycamore (Platanus racemosa)
Blackberry (Rubus vitifolia)
So. Black walnut (Juglans californica) (So. Calif.)
California Bay (Umbelularia californicum) (So. Calif.)
Bracken fern (Pteris aquilinum) (Cen. Calif.)
Current (Ribes spp.)
Twinberry (Lonicera involucrata) (No. Calif.)
Lady fern (Athyrium felix-femina)
Salmonberry (No. Calif.)
Bayberry (No. Calif.)

E. Vernal Pools

Downingia (Downingia sp.)
Meadow-foxtail (Alopecurus howellii)
Hair Grass (Deschampsia danthonioides)
Quillwort (Isoetes sp.)
Meadow-foam (Limnanthes sp.)
Pogogyne (Pogogyne sp.)
Flowering Quillwort (Lilaea scilloides)
Cryptantha (Cryptantha sp.)
Loosestrife (Lythrum hyssopifolium)
Skunkweed (Navarretia sp.)
Button-celery (Eryngium sp.)
Orcutt-grass (Orcuttia sp.)
Water-starwort (Callitriche sp.)
Waterwort (Elatine sp.)
Woolly-heads (Psilocarpus sp.)
Brodiaea (Brodiaea sp.)
Tillaea (Crassula aquatica)

APPENDIX E. GLOSSARY OF TERMS

Aquaculture

". . . 'aquaculture' means the culture and husbandry of aquatic organisms, including, but not limited to: fish, shellfish, mollusks, crustaceans, kelp and algae. Aquaculture shall not mean the culture and husbandry of commercially utilized inland crops, including, but not limited to: rice, watercress and bean sprouts." (Public Resources Code, Division 1, Chapter 4, Section 828) (See also footnote #5 on page 11).

Biological productivity

Biological productivity generally refers to the amount of organic material produced per unit time (see also footnote 19 on page 23)

"Coastal-dependent development or use"

(see APPENDIX A [Section 30101])

Coastal-dependent industrial facility

A coastal-dependent industrial facility is one which requires a site on, or adjacent to, open coastal waters to function.

"Development"

(see APPENDIX A [Section 30106])

"Energy facility"

(see APPENDIX A [Section 30107])

"Environmentally sensitive area"

(see APPENDIX A [Section 30107.5])

Estuary

As estuary is a coastal water body usually semi-enclosed by land, but which has open, partially obstructed, or intermittent exchange with the ocean and in which ocean water is at least occasionally diluted by fresh water runoff from the land (see also page 4 and APPENDIX D).

"Feasible"

(see APPENDIX A [Section 30108])

Fen

A fen is a poorly defined regional term for a type of marsh (see APPENDIX D) usually said to be formed on peat that is circumneutral or alkaline in pH; vegetation is marked by high species diversity. A fen is equivalent to the sedge-meadow of many areas. (Note: To date the only fen known to exist in the coastal zone is Inglenook Fen in Mendocino County).

Fill

(see APPENDIX A [Section 30108])

Functional capacity

Functional capacity refers to the ability of a particular ecosystem to be self-sustaining and to maintain natural species diversity (also refer to page 17).

Healthy populations

The phrases, ". . . healthy populations of all species of marine organisms . . and ". . . optimum populations of marine organisms . . ." (Sections 30230 and 30231, respectively) refer generally to the maintenance of natural species diversity, abundance, and composition.

Hydric soil

Hydric soils are soils that for a significant period of the growing season have reducing conditions* in the major part of the root zone and are saturated** within 25 cm of the surface. Most hydric soils have properties that reflect dominant wetness characteristics, namely, they have immediately below 25 cm dominant colors in the matrix as follows:

1. If there is mottling, the chroma is 2 or less.

2. If there is no mottling, the chroma is 1 or less.

("Wet Soils of the United States" (draft copy), January 9, 1980, United States Department of Agriculture, Soil Conservation Service.)

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* Reducing conditions means soil solution is virtually free of dissolved oxygen.

** A soil is considered saturated at the depth at which water stands in an unlined borehole or when all pores are filled with water. Soils (temporarily) saturated as a result of controlled flooding or irrigation are excluded from hydric soils.

Hydrophytic plant

Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content (i.e., plants typically found in wet habitats).

Lake

A lake is a confined, perennial water body mapped by the United States Geologic Survey on the 7.5 quadrangle series, or identified in a local coastal program.

Mesophytic plant

Any plant growing where moisture and aeration conditions lie between extremes (i.e., plants typically found in habitats with average moisture conditions, not usually dry or wet).

Optimum populations

(see definition of "healthy populations" above)

Riparian habitat

A riparian habitat is an area of riparian vegetation and associated animal species. This vegetation is an association of plant species which grow adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of fresh water (see also APPENDIX D).

River or Stream

A "river or stream" is a natural watercourse as designated by a solid line or dash and three dots symbol shown on the United States Geological Survey map most recently published, or any well-defined channel with distinguishable bed and bank that shows evidence of having contained flowing water as indicated by scour or deposit of rock, sand, gravel, soil, or debris.

Vernal pool

A vernal pool may be defined generally as ". . . a small depression, usually underlain by some subsurface layer which prohibits drainage into the lower soils profile, in which, during the rainy season, water may stand for periods of time sufficient to prohibit zonal vegetation from developing. The habitat is intermediate in duration or inundation between marshes (never or only rarely dry) and most zonal communities (never or only rarely submerged)." ("The Vegetation of Vernal Pools: A Survey." By Robert F. Holland, Department of Agronomy & Range Science, University of California, Davis. Published in, Vernal Pools: Their Ecology and Conservation. A Symposium Sponsored by the Institute of Ecology, University of California, Davis, May 1-2, 1976).

Wetland

(see APPENDICES A and D [Section 30121])

Xerophytic plant

Any plant growing in a habitat in which an appreciable portion of the rooting medium dries to the wilting coefficient at frequent intervals (i.e., plants typically found in very dry habitats.)

Commission District Staff and the characteristics of the terrain, landform and vegetati surrounding the parcel. In some cases, either through general planning, the LCP's or the CEQA process this kind of information has been synthesized into an archaeological sensitivity map which divides a geographic area into various degrees of archaeological sensitivity.

SITES OF LOW ARCHAEOLOGICAL SENSITIVITY OR POTENTIAL

If the Commission Staff determines the archaeological sensitivity of a particular parcel is low, and there is only a slight potential that archaeological resource would be encountered by any excavation or grading that is planned, Staff will recommend the Commission issue the permit subject to the following standard condition:

> Should archaeological resources be disclosed during any construction phase of the project, all activity which could damage or destroy these resources shall be temporarily suspended until the site has been examined by a qualified archaeologist and mitigation measures have been developed to address the impacts of the projection archaeological resources. Such mitigation measures shall be reviewed by the State Office of Historic Preservation and approved by the Executive Director of the Regional Commission.

SITES OF MODERATE TO HIGH ARCHAEOLOGICAL SENSITIVITY AND POTENTIAL

When a permit application is received for a project in an area which, in the judgment of Commission Staff has moderate to high archaeological sensitivity, the Commission Staff may require the applicant to submit with the application information developed by a qualified archaeologist regarding the presence and significance of archaeological materials. The selection of the archaeologist retained by the applicant will be subject to the approval of the Executive Director. Appendix A details the necessary qualification Archaeological Investigations generally fall into three phases:

1) Archaeological Reconnaissance: This phase is designed to locate archaeological sites. It typically background research, including literature review and a search of the records in the Information Center of the California Archaeological Inventory. Where the literature review/archival search finds that an adequate survey of the area has previously been done, with no resources indicated, additional work is usually not necessary. Otherwise a surface reconnaissance will be necessary. The surface reconnaissance entails a walkover of the site and inspection of the land surface for visible archaeological resources. Occasionally the reconnaissance will require some subsurface testing to determine or confirm the presence of an archaeological resource, especially in areas of rapid alluvial accumulation, in sand dune deposits or in filled areas. At the conclusion of this work, a report will be prepared to detail reconnaissance methodology, findings and recommendations.

In most projects this relatively inexpensive initial study will be the only investigation necessary.

ARCHAEOLOGICAL GUIDELINES (Adopted 12/16/81)

The Coastal Zone was probably the most densely occupied region in California in pre-historic times. The same amenities which attract people to the Coastal Zone today, including a mild climate and abundant and varied natural resources, attracted aboriginal peoples in pre-historic times. As a result, the probability of discovering archaeological materials in the Coastal Zone is unusually high, and the potential for the destruction of such resources through development is considerable.

If not properly located and designed, development can significantly impact archaeological resources. Excavation or grading commonly performed as part of the site preparation for a project can obliterate archaeological materials, or disturb their provenance to such an extent that the information that could have been derived from the knowledge of their relative position would be permanently lost. Development can also impact archaeological resources by compacting the archaeological materials, or by changing their chemical composition. As so many archaeological sites have been destroyed or damaged as a result of man-made developments or natural processes, the remaining sites, even though they may be less rich in archaeological materials, have become increasingly valuable. Additionally, because archaeological sites if studied collectively may provide information on subsistence and settlement patterns, the loss of individual sites can reduce the scientific value of the sites which remain intact.

Archaeological sites also have great cultural and religious significance for contemporary Native Americans and their destruction or desecration is of great concern to the Native American community.

The Coastal Act establishes a mandate to protect archaeological resources and mitigate the impact of development upon them. Public Resources Code Sections 30001.5 and 30244 state:

> Section 30001.5 The Legislature further finds and declares that the basic goals of the state for the coastal zone are to:
>
> (a) Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and manmade resources...
>
> Section 30244 Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

The following Interpretive Guidelines are in two parts (a) guidelines to mitigate the archaeological impact of coastal development in general and (b) guidelines for the conduct of archaeological studies themselves. Additionally, a discussion providing guidance for Local Coastal Programs is included.

A. MITIGATION OF ARCHAEOLOGICAL IMPACTS OF COASTAL DEVELOPMENTS:

In order for archaeological resources to be protected, they must first be identified. Several types of information can indicate the potential a particular parcel has for containing archaeological resources. These include the pattern of known archaeological sites as catalogued by the regional Information Centers of The California Archaeological Inventory; specific studies of the parcel that may have been done under CEQA; preliminary field checks by the

2) Testing and Determination of Significance. Where an archaeological site has been found in the reconnaissance, further work is performed to define the precise location and boundaries of the archaeological site, and to evaluate its composition and signficance. Subsurface testing is usually done through hand excavation of several archaeological test units. The specific procedures will depend on the information required and the type of archaeological resource. A sites signficance is determined on the basis of site integrity, research potentia ethic and historical value and the potential for public appreciation. Where the testing is extensive, or where it may affect an environmentally sensitive area special conditions will apply (see Section "B" below).

3) Mitigation Plan. At the completion of testing the potential project impacts can be assessed and appropriate protection or mitigation measure are formulated. The mitigation plan details constraints and permit conditions which will apply to the proposed project, stipulating actions to preserve the site or mitigate unavoidable damage.

MITIGATION MEASURES

The type of mitigation which is necessary or appropriate to protect archaeological resources varies with the particular circumstances surrounding each project. As recommended by the consulting archaeologist and approved by the Commission as conditions on the project, they may range from complete avoidance of the site to a full scale excavation and analysis of the archaeological materials. Arranged by order of preference, these mitigation measures include:

1. Prohibiting any development over archaeological resources

2. Permitting only open space uses (e.g., landscaping) over archeological sites

3. Locating development on the least sensitive or significant portions of an archaeological site

4. Filling over all archaeological areas with appropriate materials (e.g., 12-18 inches of clean sand) before placing structures on the site

5. Partially Archaeologically Excavating: Where there is no way to avoid partly damaging a site, requiring that the excavation that must be done (for the foundation, sewer line or the like) be done scientifically by archaeologists.

6. Conducting an archaeological survey and salvage excavation prior to commencing construction.

Archaeological excavations as in 5 and 6 above will be subject to the provisions of Section B below.

The mitigation plan may also require that an archaeological monitor be present during all construction in an archaeological site or sensitive area.

B. GUIDELINES FOR ARCHAEOLOGICAL EXCAVATIONS

Archaeological work in the Coastal Zone generally occurs through either academic and professional research or through mitigation programs carried out under NHPA, CEQA, NEPA or the Coastal Act. These programs are intended to avoid or mitigate the impact of some other type of development (i.e., construction of a building, trenching for a pipeline, grading for a road) on archaeological resources. Where an archaeological investigation involves "grading removing... or extraction of any material..." it is in itself a development under PRC 30106 and requires a permit action by the Commission.

I PROTECTION OF ARCHAEOLOGICAL RESOURCES IN THE COASTAL ZONE

Archaeological resources, the material evidence remaining from human life and culture in past ages, are often extremely fragile and easily degraded or destroyed. Important scientific information is often contained not only in archaeological artifacts themselves, but in how they are deposited in a site, and related to the surrounding environment. Moreover, some materials found in an archaeological site have a profound cultural and religious significance to some people, especially related Native American groups. Key elements of an effective program to protect and mitigate the impact upon these resources include assuring that only qualified persons perform archaeological work, that their work contributes to our understanding of history or prehistory and that Native American and other affected groups be consulted in the process of such work.

Professional Qualifications

The undisciplined disturbance of archaeological sites, such as that done by pot-hunters, results in the loss of valuable scientific information and destruction of the resource. Individuals trained in and meeting the standards of the archaeological profession have a high standard of regard for the conservation of archaeological resources in their work. Applicants for any subsurface excavation of an archaeological site in the coastal zone must meet, or work under the direct supervision of someone who meets the U.S. Department of Interior minimum standards for archaeological consultants. These standards are additionally endorsed by the State Office of Historic Preservation. The standards are found in 36 CFR 66 and 36 CFR 64 and are paraphrased in Appendix A. Members of the Society of Professional Archaeologists (SOPA) certified for field research are considered to meet these qualifications.

Research Design

For any archaeological work involving excavation of more than two meters of surface area (see "Permitting" below) the coastal permit application shall include a written research design. The research design is an explicit statement of research objectives and a program for carrying out these objectives. It is intended to assure that disturbance of the archaeological site is warrented in terms of the information that will be yielded or the mitigation that is achieved. The research design should include (1)a statement of the theoretical problem, with reference to the problems of regional concern, (2)a research working hypothesis, (3) a statement of data required to confirm or reject the hypothesis, (4) field and laboratory data collection procedures, (5) techniques to be used in data analysis, and (6) arrangements for curation of collections when appropriate, and dissemination of the reasearch findings.

A briefer outline research design may be used for projects involving only a testing program. Such a program is limited to obtaining data necessary for delineating a site, evaluating its potential significance, assessing the impact of a proposed development and estimating mitigation costs for those impacts.

Peer Review Statement

In order to provide for the maximum conservation of the archaeological resources and to provide the Commission with a broarder perspective on the values of proposed archaeological works, the permit application involving excavation of more than two meters of surface area shall include a statement evidencing that the research design has been submitted to at least three other qualified archaeologists practicing in the region where the work is proposed. The research design shall also be filed for informational purposes with the Archaeological Inventory regional Center. Where the city or county in which the project is located has an archaeologist on staff, he or she shall be included in the three peer reviewers. The statement shall include copies of the comments offered by the reviewers and the results of the peer review.

Consultation with Affected Native Americans

Any application proposing excavation of more than 2 square meters of surface area shall include a statement that the appropriate Native American groups have been consulted in the development of the proposed investigation, and have reviewed the research design. The statement shall provide copies of any written comments and describe other results of the consultation. The Native American Heritage Commission maintains a county listing of the affected groups that are to be consulted and can facilitate these consultations. Particular attention shall be given to resolving any conflicts over the treatment of burials that may be encountered in the archaeological site.

II. PROTECTION OF OTHER COASTAL RESOURCES IN ARCHAEOLOGICAL INVESTIGATIONS

Archaeological investigations in the coastal zone may involve a variety of different procedures including surface disking, test hole augering and backhoe trenching, and full scale site excavation. In addition to the impact on the archaeological resources themselves, the principal concerns with these activities is their potential impacts on environmentally sensitive areas. The Coastal Act of 1976 states:

> Section 30107.5
>
> "Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

Typical examples of environmentally sensitive areas include wetlands (coastal streams, lagoons, sloughs, esturies, coastal lakes, vernal pools), special coastal land forms and aggregations of major vegetation such as dunes, native oak, pine or cypress groves, native bunch grass, rare or endangered plant species and habitat areas for rare or endangered animals.

An archaeological investigation may have the potential for directly or indirectly impacting an evironmentally sensitive area through, for example, direct disruption due to excavation, through developing access to the study site, or

through erosion or runoff from a large excavation to an area such as a coastal lagoon. The application shall specify the potential for such impacts.

Individuals interested in conducting archaeological investigations can find information about the type of and location of environmentally sensitive areas present in specific areas in the certified Local Coastal Land Use Plan for the area and/or by contacting the Coastal Commission District Office.

III. PERMITTING ARCHAEOLOGICAL WORK IN THE COASTAL ZONE

Some archaeological work typically carried out in the Coastal Zone, such as a reconnaissance site walkover, is not a development under the Act. However, where material is to be removed, as in an archaeological excavation, Commission permit action is required. Some archaeological reconnaissance and testing involving removal of material would have no potential for significant adverse effect on the archaeological or other coastal resources. These types of activities are defined and categorized below. To avoid unnecessary delay of this work, an administrative permit procedure will generally be used. If and when the Commission adopts procedures for waivers of projects, this category of projects may be also considered for waivers.

Administrative Permits

An administrative permit will generally be issued, as determined by the Executive Director, where an application is for archaeological work that:

1) is reconnaissance work to locate, identify and define an archaeological site and,

2) will be conducted by a qualified archaeologist (as defined in Appendix A) and,

3) will not disturb any sensitive environmental habitats, and

4) will not result in the excavation or disturbance of more than 2 square meters of surface area, and

5) will not affect Native American burials or cemeteries, or where agreement has been reached with affected Native Americans on this issue.

Regular Calendar Items/Phased Permits

Applications for archaeological investigations which could significantly affect archaeological or other resources not meeting the criteria above will generally be handled as consent or hearing items.

As an alternative to applying to the Commission for each individual archaeological study, individuals or institutions, such as universities, which plan extensive archaeological work within the Coastal Zone over time may apply for a phased permit. The permit application shall specify a distinct geographic area which will be covered by the permit and shall include a research design which in part specifies the variety of planned activities over the period of the permit (generally three years). Statements of peer review and Native American consultation, as described above, shall be included and should detail the ongoing

involvement of these groups as the activities proceed. In granting the permit the Commission may articulate the specific conditions that would apply to each activity. Work could proceed on each new activity delineated by the permit after notification to and approval by the District Director, without requiring separate permits and hearings.

STANDARD CONDITIONS

The following conditions will be applied to all permits for archaeological investigations.

a. The archaeologist in direct charge of field work, or a qualified designee, shall be on site at all times when work is in process.

b. Archaeological excavations not a permanent part of permitted construction shall be restored by back filling the excavation and otherwise leaving the area in as near to original condition as possible.

c. All operations shall be conducted in a manner to prevent the erosion of land, pollution of water resources, and damage to the watershed, and to prevent or reduce to the fullest extent the scarring of lands.

d. Within six weeks of the conclusion of field work, a synopsis of the new materials found and their archaeological significance shall be provided to the State Historical Preservation Office and the Commission.

e. No later then one year after completion of field work a final report on the excavation and analysis shall be submitted to the State Historic Preservation Office and the Commission.

CONFIDENTIALITY

Commission staff will not identify the exact location of an archaeological site in any reports available for general public review. Such information provided by the applicant or others involved with a permit will be marked "Not for Public Review" and kept in a file for use only by staff and others having a bona-fide need for the information as determined by the District Director.

C. PROTECTION OF ARCHAEOLOGICAL RESOURCES THROUGH LOCAL COASTAL PROGRAMS

The protection of archaeological resources through the Local Coastal Plans poses essentially the same difficulties presented by the Commission's permit review process.

At a minimum, the Local Coastal Plans must include a general policy comparable to Public Resources Code Section 30244 regarding the protection of archaeological resources. In addition, the Local Coastal Plans should also include more specific policies and zoning requirements which set forth the procedures and standards by which archaeological resources are to be protected. These provisions must address the problem of initially identifying archaeological resources as well as the type and level of mitigation which will be required to protect archaeological materials from impacts stemming from development. The preceeding Guidelines establish the Commission's standard for review of LCPs.

The initial identification of archaeological resources is both a critical step in the protection of these resources, and one which can be greatly facilitated by the "up-front" work of the LCP. The preparation of archaeological sensitivity maps is a practical, efficient, and effective method of identifying archaeological resources. When prepared by a qualified archaeologist, such maps can synthesize the data previously collected in a region and, based upon terrain, vegetation and other physical features, extrapolate the data to classify a given area as to the relative potential for containing archaeological resources. While such maps cannot be used to definitively determine the presence or absence of archaeological material, they can be used to choose the appropriate level of archaeological study. The Commission's Guidelines provide a model for such a system.

Because of the high probability of discovering archaeological resources in the Coastal Zone, the Local Coastal Plan should include a policy requiring all discretionary review projects be conditioned to stipulate that work on the project be stopped in the event that archaeological materials are discovered during construction, regardless of the archaeological designation of the area in which the development is located. Section A of the Guidelines contains a model of such a policy.

Finally, the Local Coastal Program should also include provision for the procedures outlined in the guidelines relative to professional qualifications, research design, peer and Native American consultation, protection of environmentally sensitive habitats, standard mitigation conditions, and confidentiality.

APPENDIX A

Professional Qualifications

It is essential that any location and identification study be staffed by qualified persons. While students, interns, trainees, and volunteers are commonly and effectively used as team members, it is vital that they be properly supervised by persons with appropriate training and experience.

In the following definitions, a month of professional experience need not consist of a continuous month of full-time work but may be made up of discontinuous periods of full-time or part-time work adding up to the equivalent of a month of full-time experience.

The minimum professional qualifications in archaeology are (a) a graduate degree in archaeology, anthropology, or a closely related field, or equivalent training accepted for accreditation purposes by the Society of Professional Archaeologists, (b) demonstrated ability to carry research to completion, usually evidenced by timely completion of theses, research reports, or similar documents, and (c) at least 16 months of professional experience and/or specialized training in archaeological field, laboratory, or library research, administration, or management, including at least 4 months experience and/or specialized training in the kind of activity the individual proposes to practice. For example, persons supervising field archaeology should have at least 1 year or its equivalent in field experience and/or specialized field training, including at least 6 months in a supervisory role. Persons engaged to do archival or documentary research should have had at least 1 year of experience and/or specialized training in such work. Archaeologists engaged in regional or agency planning or compilance with historic preservation procedures should have at least 1 year of experience in work directly pertinent to planning, compliance actions, etc., and/or specialized historic preservation or cultural resource management training. A practitioner of prehistoric archaeology should have had at least 1 year of experience or special training in research concerning archaeological resources of the prehistoric period. A practitioner of historic archaeology should have had at least 1 year of experience in research concerning archaeological resources of the historic period.

Adopted December 16, 1981

DEFINITIONS

Where used in the specific guidelines, the following definitions of terms should apply:

1. Canyon Setback. In situations where other Interpretive Guidelines or Coastal Act policies do not apply, an adequate setback, generally no less than 10 feet in highly developed urban areas, from the crest of the slope of a canyon. Where existing structures are already built closer than this to the canyon rim, new structures shall not encroach on the line of primary canyon vegetation.

2. Stringline Method of Preventing Beach Encroachment. In a developed area where new construction is generally infilling and is otherwise consistent with Coastal Act policies, no part of a proposed new structure, including decks, shall be built farther onto a beachfront than a line drawn between the most seaward portions of the adjoining structures. Enclosed living space in the new unit should not extend farther seaward than a second line drawn between the most seaward portions of the enclosed living space of the adjoining structure.

Adopted May 3, 1977

Appendix B

Sample Form Letters For Use In The Review Of CEQA Required Documents And The Processing Of Coastal Development Permit Applications

Form Letter One

Purpose: *This form letter can be used as a guide for commenting on an initial study, negative declaration, or notice of preparation for an environmental impact report involving a wetland development project in the coastal zone.*

Date

Dear (*insert name of individual or agency receiving comments*):

Thank you for the opportunity to comment on the (*insert complete name of document reviewed*). The project referenced in this document involves development activities in the coastal zone and, as presented, will require a coastal development permit from the California Coastal Commission. Further, it appears that the proposed project may affect a wetland within the coastal zone through dredging, diking, filling, or other similar activity. The Coastal Act provides clear policies that allow for the regulation of development activities within or affecting wetlands. Among other requirements, Section 30233 of the Coastal Act identifies eight allowable uses, requires that the proposed project be the least environmentally damaging feasible alternative, and where applicable, requires feasible and appropriate mitigation. Specifically, Section 30233 provides, in part, that:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

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

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetlands, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the

degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

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

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

In addition, Coastal Act Sections 30230 and 30231 requires the protection of marine and biological resources. Section 30230 provides that:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a

manner that will sustain the biological productivity of coastal waters and will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 provides that:

> The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

In order to assess the potential project effects on wetlands and their consistency with the Coastal Act, Commission staff have developed detailed filing requirements for coastal development permit applications proposing wetland development projects. Enclosed with this letter is a list of information required by Commission staff for the filing and processing of a coastal development permit application for a project proposing development in a wetland. It is suggested that the lead agency consider the Coastal Act sections cited above and the attached list of requirements and incorporate the necessary analyses into the appropriate documents required under CEQA. This will ensure that the resulting documents satisfy both the CEQA requirements and the California Coastal Commission's requirements for filing a complete coastal development permit application.

Thank you for providing us the opportunity to comment on this document. Should you have any questions, please call (*insert name and phone number of CCC staff person*).

Sincerely,

District Director

enclosure (*enclose a copy of the list in Appendix B)*

Form Letter Two

Purpose: *This form letter can be used as a guide for commenting on an environmental impact report involving a wetland development project in the coastal zone.*

Date

Dear (*insert name of individual or agency receiving comments*):

Thank you for the opportunity to comment on the (*insert complete name of document reviewed*). The project referenced in this document involves development activities in the coastal zone and, as presented, will require a coastal development permit from the California Coastal Commission. Further, it appears that the proposed project may affect a wetland within the coastal zone through dredging, diking, filling, or other similar activity. The Coastal Act provides clear policies that allow for the regulation of development activities within or affecting wetlands. Among other requirements, Section 30233 of the Coastal Act identifies eight allowable uses, requires that the proposed project be the least environmentally damaging feasible alternative, and where applicable, requires feasible and appropriate mitigation. Specifically, Section 30233 provides, in part, that:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

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

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetlands, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive

wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

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

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

In addition, Coastal Act Sections 30230 and 30231 requires the protection of marine and biological resources. Section 30230 provides that:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters, and will

maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 provides that:

> The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

In order to assess the potential project effects on wetlands and their consistency with the Coastal Act, Commission staff have developed detailed filing requirements for coastal development permit applications proposing wetland development projects. Enclosed with this letter is a list of information required by Commission staff for the filing and processing of a coastal development permit application for a project proposing development in a wetland. The items identified with an "X" on the enclosed list are not included in the environmental impact report for the proposed project. Commission staff recommend revision of the environmental impact report to include the noted items, since they will be necessary for filing a complete coastal development permit application.

Thank you for providing us the opportunity to comment on this document. Should you have any questions, please call (*insert name and phone number of CCC staff person*).

Sincerely,

District Director

enclosure (*enclose a copy of the list in Appendix B)*

Form Letter Three

Purpose: *This form letter can be used as a guide for notifying an applicant that their coastal development permit application is incomplete.*

Date

Subject: Coastal Development Permit Application (No. *insert application number*) for (*include a brief description of the project and its location*)

Dear (*include name of applicant or their agent*):

The Commission staff has completed an initial review of your coastal development permit application, which was received on (*insert date of application receipt*). This review found the proposed project involves activities affecting wetland resources. As a result, your application was also evaluated to determine the presence of all information required for development activities affecting these resources. This evaluation showed the information submitted in support of your application is not sufficient for complete analysis of all potential wetland impacts. Therefore, Commission staff have determined that **your application is incomplete and cannot be filed at this time**. Enclosed with this letter is a list of information necessary for the filing of a coastal development permit application for a project involving activities affecting wetland resources. The items identified with an "X" on the enclosed list were not included with your initial application. Please submit the required information to this office by (*insert appropriate date*), or this application will be returned to you.

Should you have any questions regarding this letter or your application, please call (*insert name and phone number of CCC staff person*).

Sincerely,

District Director

enclosure (*enclose list of required information from Appendix B*)

Form Letter Four

Purpose: *This form letter can be used as a guide for requesting additional information after a permit for a development project affect wetland resources has been filed.*

Date

Subject: Coastal Development Permit Application (No. *insert application number*) for (*include a brief description of the project and its location*)

Dear (*include name of applicant or their agent*):

In reviewing the above-referenced permit application, Commission staff have determined the proposed project involves activities affecting wetland resources. As a result, your application was also evaluated to determine the presence of all information required for development activities affecting these resources. On the basis of this detailed review, it has been determined that the information submitted in support of this application is not sufficient for completing the required comprehensive analysis of potential wetland impacts. Please submit the information requested below, so that the evaluation of your permit application can be completed. (*Include a clear, concise list of the information required.*)

1.

2. etc.

This request is made pursuant to the Permit Streaming Act, Government Code Sections 65944(a) and (c), which authorize the following requests for information:

1) Requests for clarification, amplification, correction, or supplementation of the information included with the permit application; and

2) requests for information necessary to enable the Coastal Commission to fulfill its obligations under the California Environmental Quality Act.

Please be advised that the Permit Streamlining Act expressly authorizes the Coastal Commission to deny your application on the basis of an applicant's failure to furnish the information requested in this letter (Government Code Section 65956[c]). Please

submit the requested information to this office by (*insert appropriate date*), to ensure processing of your permit application is not further delayed.

Should you have any questions regarding this letter or your application, please call (*insert name and phone number of CCC staff person*).

Sincerely,

District Director

Appendix C

A List Of Information Required For Evaluation Of Coastal Development Permit Applications Proposing Development Activities Affecting Wetland Resources

INFORMATION REQUIRED FOR THE EVALUATION OF A COASTAL DEVELOPMENT PERMIT APPLICATION PROPOSING DEVELOPMENT ACTIVITIES IN A WETLAND.

All coastal development permit applications must contain information required in Section 13053.5 of the CCC Administrative Regulations. In addition, applications for development projects affecting wetland resources must include all maps necessary to describe the project, results of biological, soil, and hydrological surveys, an alternatives analysis, plans for mitigation and monitoring as appropriate, and an ecological study. At a minimum, the application should contain the following information:

1) A comprehensive project description.

2) A description of wetland habitat type(s) and the approximate area each habitat covers using the classification procedures described in Cowardin et al. (1979)[1].

3) Detailed topographic base map(s)[2] of the site with information taken from recent (1-2 year old) aerial photographs. If only older aerial photographs are available, the site information must be updated from field visits. The map should indicate 0.5 to 1.0 foot contours, the specific datum reference used (either mean sea level or mean lower low water), and show the applicant's property boundaries and adjacent property boundaries (including parcel lines of any tidelines, submerged lands or public trust lands). All parcels should be identified by their assessor parcel numbers.

4) A detailed hydrologic map. For tidal wetlands the map should show areas inundated at high and low tides, along with estimates of the effective tidal range and tidal lag. For non-tidal wetlands the map should show the permanent or seasonal water patterns of inundation (including sources) in years of low, average, and high rainfall.

5) A detailed vegetation map. This map should identify the type, location, and percent cover of all plant species.

6) A detailed soils map. This map should identify the type and location of all soils and include a description of the soil types.

---

1 Cowardin, L.M., W. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetland and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Office of Biological Service. Washington D.C. FWS/OBS-79/31.

2 All maps should be completed at the same scale and use the same orientation to allow overlaying.

7) A detailed site map. This map should show the location and size of the proposed development, including and dikes, culverts, or tide gates.

8) A grading plan. This plan should show the extent and quantity of filling and/or dredging, the type and source of fill and/or dredge material including determinations of grain size and tests for possible pollutants, and the location of any proposed dredge disposal site.

9) History of the site, if available, including:

   a) Collection of older aerial photographs and maps. These historic photographs and maps should be used to establish, if possible, the previous natural state of the wetland prior to any artificial modification.

   b) Collection and summary of all available studies of the wetland site. This should include land use studies, environmental documents, and scientific reports. Existing land use policies and any approved plans for the site should also be included.

10) A complete description and analysis of existing ecological conditions at the project site, including:

   a) A discussion of the ecological value of the plants and animals using the wetland and adjacent areas.

   b) A discussion of the wetlands present functions and values.

   c) An evaluation of potential and existing impacts including the effects of sedimentation and pollutants from residential, industrial, agricultural, and flood control activities to the wetland and associated watershed.

11) An analysis and discussion of project impacts, including an analysis of whether the project maintains and enhances the functional capacity of the wetland. "Functional capacity" means the ability of the wetland or estuary to be self-sustaining and to maintain natural species diversity. In order to establish that the functional capacity is maintained, the applicant must demonstrate all of the following:

   a) That the project does not alter presently occurring plant and animal populations in the ecosystem in a manner that would impair the long-term stability of the ecosystems, that is, that the natural species diversity, abundance, and composition are essentially unchanged as a result of the project.

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 or habitat, which is essential to the natural biological function of the wetland or estuary.

d) That the project does not significantly reduce consumptive (e.g., fishing, and hunting) or non-consumptive (e.g., water quality, and bird watching) values of the wetland or estuary.

12) An alternatives analysis that at a minimum includes the following:

a) A review of all feasible alternatives including:

i) Consideration of alternative sites, including sites which are completely outside the wetland.

ii) Reconfiguration of the project including a reduction in project size, density, or coverage.

b) Identifies the wetland impacts of each alternative, including a determination of the amount of habitat lost and an analysis of the impacts to the functional capacity of the system.

c) Selects the least damaging feasible alternative.

13) A mitigation plan. When there is a potential loss of existing wetland habitat or value, a plan must be included that, if implemented, will result in the replacement of all lost wetland functions and provide a net gain in wetland acreage. A mitigation plan can take several forms, although a restoration plan is the most common form submitted to the CCC. The list below assumes that wetland restoration is the type of mitigation chosen.

a) All restoration plans must at a minimum include the following:

i) Clearly stated goals and objectives that provide for the establishment of functions and values at least equal to those occurring at the impact site. The stated goals and objectives should also be consistent with established regional habitat goals where possible. These regional goals must identify functions and or habitats most in need of replacement or restoration and must be as specific as possible.

ii) Adequate baseline data regarding the biological, physical, and chemical criteria for the restoration area.

iii) Documentation that the project will continue to function as a viable restored wetland site over the long term.

iv) Sufficient technical detail on the restoration design including, at a minimum, an engineered grading plan and water control structures, methods for conserving or stockpiling topsoil, a planting program including removal of exotic species, a list of all species to be planted, sources of seeds and/or plants, timing of planting, plant locations and elevations on the restoration base map, and maintenance techniques.

v) Documentation of performance standards, which provide a mechanism for making adjustments to the mitigation site when it is determined, through monitoring, or other means that the restoration techniques are not working.

vi) Documentation of the necessary management and maintenance requirements, and provisions for timely remediation should the need arise.

vii) An implementation plan that demonstrates there is sufficient scientific expertise, supervision, and financial resources to carry out the proposed activities.

viii) A monitoring program (see below for more details).

b) For a restoration plan to be deemed acceptable, it must also include evidence or other conclusive information that:

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

ii) A bond or other method exists to guarantee successful completion of the mitigation project.

iii) The site is located in an area no longer functioning in a manner beneficial to wetland species, such as a formerly productive wetland or estuary that is now biologically unproductive dry land.

iv) The site can be restored to "equal or greater biological productivity" (Coastal Act Section 30607.1) than the area lost, with the same type and variety of plant and animal species. That is, the mitigation wetland would replace the functions and values existing at the impacted wetland.

v) The site is located in the same region (e.g., within the same water body or watershed) as the wetland impacted through development.

c) The restoration plan shall include detailed construction and management plans that:

i) Identify the habitat values that will be created at the restoration site and the time frame for completion.

ii) Establishes monitoring and maintenance programs that provides an objective way to evaluate the success of the restoration project and ensure its long-term maintenance.

15) The monitoring plan provides an objective way to evaluate the success of the restoration project. When properly conducted, monitoring provides invaluable information regarding:

- Compliance of the restoration plan with the stated restoration goals.
- Identification of major problems or flaws in the restored area.
- Provide ways to improve future wetland restoration plans.

The monitoring program is intended to document changes in the physical, chemical, and biological status of the restored area through the collection and analysis of relevant data. The monitoring plan should include the following components:

a) Provisions for independent monitoring of the site for at least five years **after** completion of the mitigation project. The intent is to continue monitoring until the "success" of the project has been determined. For larger projects where new wetlands are created, extended monitoring will be required.

b) Repetitive surveys for plants and animals (including species of special concern) throughout the various habitats of the restoration area using techniques that permit a determination of species composition and abundance (percent cover for plants). Both terrestrial and aquatic animals should be surveyed. At least one survey should occur prior to any restoration activities.

c) Monitoring of hydrology. For tidal wetlands this would include a determination of the areas inundated at high and low tide, tidal prism, and water velocity. For non-tidal wetlands, this would include determination of permanent and seasonal patterns of inundation and water sources.

d) Monitoring of water quality. Repetitive sampling of various chemical and physical constituents such as salinity, pH, nutrient concentration, dissolved oxygen, temperature, and turbidity throughout the year. The sampling pattern may vary throughout the year and may include more intensive sampling over several tidal cycles to determine short term salinity patterns.

e) Monitoring of soil chemistry. This will serve primarily to document trends in soil salinity in tidal wetlands, but may include measurements of other constituents as required.

f) Ongoing procedures for the identification and correction of problems as they arise. Such problems may be related to the physical, chemical, or biological attributes of the restoration site, or difficulties in meeting restoration objectives and timelines.

g) Provisions for timely analysis and production of annual reports. These reports will be distributed to the CCC and other interested parties. Upon completion of the monitoring program, a final monitoring report that analyses all monitoring data and presents different management options shall be completed.

Appendix D

Wetlands Resource And Regulatory Agencies Contact

Preface

This contact list is intended to facilitate communication and coordination among all levels of government regarding activities involving wetlands. The document contains an address and phone list of individuals involved in the management, regulation, and preservation of California's wetlands. Individuals from both State and federal agencies are listed. Additionally, a table is included that cross-references the regional offices of State and federal agencies relative to various geographic areas of the State.

This is a publication of the State of California, California Coastal Commission pursuant to National Oceanic and Atmospheric Administration Award No. NA270Z0288-01. Although this document was prepared by the California Coastal Commission, much of the information contained within was originally assembled by staff of the State Water Resources Control Board.

It is intended for this contact list to be widely distributed. Anyone is free to copy and distribute this document as appropriate.

WETLANDS RESOURCE AND REGULATORY AGENCIES CONTACT LIST

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AQUATIC HABITAT INSTITUTE

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Josh Collins *Wetlands Specialist (S.F. Bay)*

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HEADQUARTERS/NORTH COAST AREA OFFICE
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Les Strnad

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Debora Lee

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Reed Holderman

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STATE HEADQUARTERS
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Robert Radovich *Wetlands Regulatory Coordinator* (916) 653-9757

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REGION 5 - LONG BEACH
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Curt Tausher (310) 590-5137

S.F. BAY CONSERVATION AND DEVELOPMENT COMMISSION

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Sacramento, CA 95814 (916) 654-2852 Fax (916) 653-3291

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STATE LANDS COMMISSION

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STATE WATER RESOURCES CONTROL BOARD AND REGIONAL WATER QUALITY CONTROL BOARDS

STATE WATER RESOURCES CONTROL BOARD
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901 P Street
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WILDLIFE CONSERVATION BOARD

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Marilyn Cundiff-Gee *Wetlands Program Manager*

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Robert Lawrence	*South Area Manager*	(415) 744-3318 x234
Carin High	*East Area Manager*	(415) 744-3318 x246
Dan Martel	*Wetland Specialist*	(415) 744-3318 x230
Molly Martindale	*Mitigation Compliance*	(415) 744-3318 x228
Jane Hicks		(415) 744-3318 x238

U.S. ARMY CORPS OF ENGINEERS, CONT.
SAN FRANCISCO DISTRICT, CONT.

Permit Section (Permit Management, 404(b)(1) Analysis, Public Interest Review)

John Hendricks	*Chief*	(415) 744-3324 x239
Mark D'Avignon		(415) 744-3324 x236
David Ammerman		(415) 744-3037 x241
Debra O'Leary		(415) 744-3324 x247
Bob Smith		(415) 744-3324 x237
Peter Straub		(415) 744-3325 x235
Craig Vassell		(415) 744-3324 x240

Impact Analysis Section (EIAs, EIS Management, Mitigation Plan Evaluation, Aerial Photos)

Lars M. Forsman	*Chief*	(415) 744-3322 x226
Peter Baye		(415) 744-3322 x223
Jennifer Vick		(415) 744-3322 x225
Wade Eakle	*Dredging Program Manager*	(415) 744-3325 x222
Karl Motoyama		(415) 744-3318 x231
Jennifer Vick		(415) 744-3322 x225

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John Gill *Chief, Regulatory*

North Coast Section

David Castanon	*Chief*
Fari Tabatabai	*Los Angeles*
Cheryl Conel	*Los Angeles*
Erin Allen	*Los Angeles*

South Coast Section

Michelle Waltz	*Chief*
Bob Smith	*Riverside County*
Fari Tabatabai	*Los Angeles County*
Mark Sudol	*Backlog*
Bruce Henderson	*Orange County*

U.S. ARMY CORPS OF ENGINEERS, CONT.

LOS ANGELES DISTRICT, CONT.

Ventura Field Office

2151 Allessandro Drive, Suite 100

Ventura, CA 93001 (805) 641-1127		Fax (805) 641-0230
Diane Noda	*Wetlands Technical Information*	(805) 641-1128
Tiffany Welch		(805) 641-2935
Mike Jewell		(805) 641-0301

San Diego Field Office

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San Diego, CA 92121 (619) 455-9406		Fax (619) 455-1060
Elizabeth White	*Wetlands Technical Information*	(619) 455-9422
David Zoutendyk	*Biologist*	(619) 455-9414

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IX

HEADQUARTERS

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WETLANDS PERMITS AND ENFORCEMENT SECTION

Clyde Morris	*Chief*	(415) 744-1962
Stephanie Wilson	*Acting Chief*	(415) 744-1968

Permits and EIS Review

Nancy Dubbs		(415) 744-1969
Harriet Hill		(415) 744-1980
Paul Jones		(415) 744-1976
Suzanne Marr	*Wetlands Planning*	(415) 744-1974
Mike Monroe		(415) 744-1963
James Romero		(415) 744-1967
Tom Yokem	*Wetlands Technical Information*	(415) 744-1975

Enforcement

Juliet Hannafin	(415) 744-1973
Robert Leidy	(415) 744-1970
Wendy Molgin	(415) 744-1966
Aaron Setran	(415) 744-1981

U.S. FISH AND WILDLIFE SERVICE

NORTHERN CALIFORNIA OFFICE
2800 Cottage Way, Room E-1823
Sacramento, CA 95825-1846 (916) 978-5408
Fax (916) 978-4619

Wetlands Branch (916) 978-4613

Mike Accituno	*Chief*
Mike Long	*Wetlands Technical Information*
Jim Browning	
Darren Fong	
Mark Littlefield	
Ruth Pratt	

CENTRAL CALIFORNIA OFFICE
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Ventura, CA 93003 (805) 644-1766 Fax (818) 904-6288

Naomi Mitchell	*San Luis Obispo, Santa Barbara Counties*
Cathy Brown	*Ventura, Inyo, Mono Counties*
Ray Bransfield	*San Bernardino County*
Carey Phillips	*Vandenberg Air Force Base*

SOUTHERN CALIFORNIA OFFICE
2730 Locker Avenue West
Carlsbad, CA 95825-1846 (619) 431-9440 Fax (619) 431-9624

404 Permit Review

Jack Fancher	*Chief*
John Hanlon	*Los Angeles County*
Loren Hays	*Orange County*
John Konecny	*Western Riverside County*
Art Davenport	*Eastern Riverside, Imperial Counties*
Ann Kreger	*North San Diego County*
Nancy Gilbert	*South San Diego County*
Martin Kenney	*San Diego Bay, Tijuana River Valley*

U.S. FISH AND WILDLIFE SERVICE, CONT.

PORTLAND EASTSIDE FEDERAL COMPLEX
911 N.E. 11th Ave.
Portland, OR 97232-4181

Dennis Peters	*Wetlands Coordinator*	(503) 231-6154
	(National Wetlands Inventory)	Fax (503) 231-6243

U.S. NATIONAL MARINE FISHERIES SERVICE

NORTHERN AREA (Above Morro Bay)
777 Sonoma Avenue, Room 325
Santa Rosa, CA 95404 (707) 578-7513 Fax (707) 578-3435

Michael Thabault

SOUTHERN AREA (Below Morro Bay)
510 West Ocean, Suite 4200
Long Beach, CA 90802 (310) 980-4043 Fax (310) 980-4047

Bob Hoffman

U.S. SOIL CONSERVATION SERVICE

STATE OFFICE
2121-C Second Street, Suite 102
Davis, CA 95616-5475 (916) 757-8200 Fax (916) 757-8382

Gene Kelly	*State Wetlands Biologist*	(916) 757-8309

CROSS REFERENCE INDEX
FOR STATE AND FEDERAL AGENCIES WITH REGIONAL JURISDICTIONS*

	State Agencies			Federal Agencies		
Region	*RWQCB*	*DFG*	*CCC*	*ACOE*	*FWS*	*NMFS*
North Coast	Santa Rosa (1)	Redding (1) Yountville (3)	San Francisco	San Francisco	Sacramento	Santa Rosa
Northeast Interior	Sacramento (5) S. Lk. Tahoe (6)	Redding (1) Ran. Cordova (2)	N/A	Sacramento	Sacramento	Santa Rosa
San Francisco Bay Area	San Francisco (2)	Yountville (3)	San Francisco	San Francisco	Sacramento	Santa Rosa
Central Coast	Oakland (2) S. L. Obispo (3)	Yountville (3)	Santa Cruz	Los Angeles San Francisco	Sacramento Ventura	Santa Rosa
East Central Interior	Sacramento (5) S. Lk. Tahoe (6)	Ran. Cordova (2) Fresno (4) Long Beach (5)	N/A	Los Angeles Sacramento	Sacramento Ventura	Santa Rosa
South Central Coast	S. L. Obispo (3) Monterey (4)	Yountville (3) Long Beach (5)	Ventura	Los Angeles	Carlsbad Ventura	Long Beach
South Coast	Monterey (4) Riverside (8)	Long Beach (5)	Long Beach	Los Angeles	Carlsbad	Long Beach
Southeast Interior	Sacramento (5) Palm Desert (7)	Long Beach (5)	N/A	Los Angeles	Carlsbad Ventura	Long Beach
San Diego Coast	San Diego (9)	Long Beach (5)	San Diego	Los Angeles	Carlsbad	Long Beach

* Region office numbers are in parentheses.