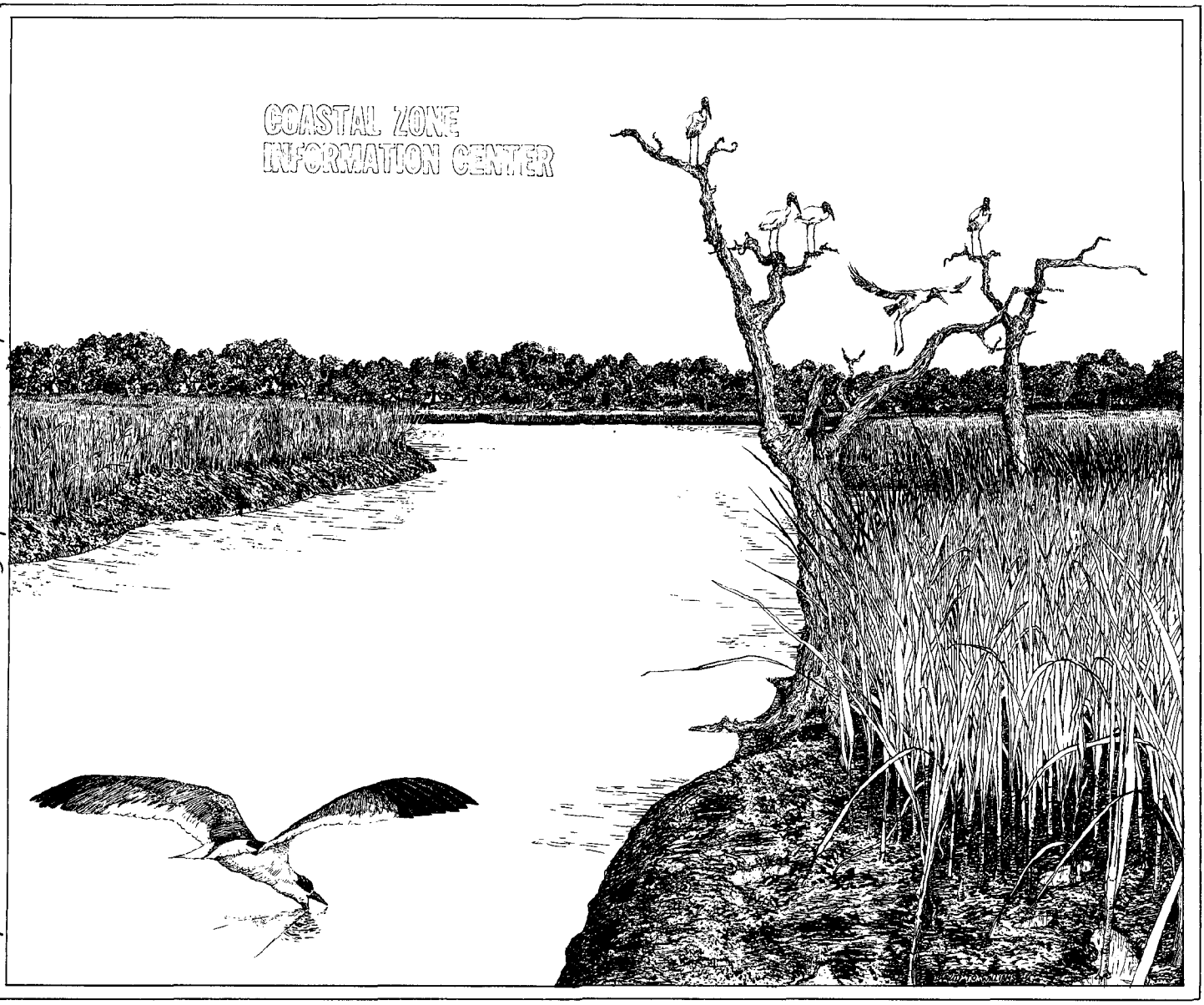
GUIDELINES FOR EVALUATING COASTAL WETLAND DEVELOPMENTS



Marine Resources Division

Wildlife and Marine Resources Department

Charleston, S.C. 29412

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FOREWORD

Although the guidelines contained in this report were prepared to guide the Marine Resources Division of the South Carolina Wildlife and Marine Resources Department, we hope they can also serve as a general stimulus for the implementation of better and more consistent management efforts in the State's coastal area by other State and local agencies. We recognize that guidelines for an overall coastal zone management system would include many more requirements and topics. However, we feel that these guidelines are consistent with the responsibilities of the Marine Resources Division and that they begin to provide a framework in which proper coastal development can take place.

All aspects of the wide variety of possible coastal developments cannot be covered in a summary set of guidelines. The discussion that follows may raise specific questions concerning individual projects. In any case, individuals or groups considering alterations of tidal wetlands are encouraged to contact the staff of the Marine Resources Division at the earliest feasible point in their planning process. This will allow early identification of potential environmental problems, time for their resolution, and should facilitate the permit granting process.

The primary responsibility for the writing of these guidelines rests with Dr. Eugene A. Laurent and Michael D. McKenzie, although important inputs were made by other personnel of the Marine Resources Division. In the preparation of these guidelines, publications of the Florida Coastal Coordinating Council and the Coastal Plains Center for Marine Development Services were drawn upon.

Dr. Edwin B. Joseph
Director, Marine Resources Division

INTRODUCTION

The tidal wetlands in the coastal zone of South Carolina are among the most valuable and fragile of the State's natural resources. While these wetlands, consisting of bays, sounds, tidal streams, marshes, bottoms, flats, mud banks, beaches, and shorelines, represent only a small percentage of the total area of the State, they account for a large majority of South Carolina's annual harvest of fish (commercial and sport) and for a large number of visitors, tourists, and new residents in coastal areas. Many people who do not enjoy the hunting and fishing opportunities afforded by these resources still are drawn by the appeal of sun, surf, and sand, and an aesthetically pleasing environment. Tidal wetlands and related highlands are also prime sites for commercial and industrial development. All of the people who use these valuable resources, whether for pleasure or profit, pour dollars into the local economy.

One of the most important components of the tidal wetlands system is the salt marsh. Marshes are not only highly productive, they are also one of nature's ways of protecting high land from erosion and storm damage. Marsh plants act as a buffer to waves, tidal currents, and flood waters. In addition, marshes perform an important waste treatment function. Due to their ability to assimilate large quantities of certain pollutants, marshes aid in alleviating the adverse effects of many types of development. Finally, ducks, rails, snipe, and many other types of waterfowl could not survive without the substantial habitat provided by these areas.

Unfortunately, all tidal wetlands are very sensitive to disruption by manmade developments. Alterations of the wetland environment can result in serious deterioration of the wetland system far from the site of the original activity and thereby reduce over a broad area the benefits generated by other wetland uses. For example, Figure 1 illustrates some of the environmental effects that can be expected from recreational developments such as condominium or second home communities, an economic development activity that alters the wetland environment in a wide variety of ways, and the possible restrictions on other activities resulting from this. As can be seen from this figure, developmental construction requires certain specific activities that affect the environment and that in turn, can restrict other economic developments.

Because of the importance of tidal wetlands to the State in a variety of uses, their sensitivity and vulnerability, and the possibility of unexpected side-effects, it is important that care be taken in any development affecting these areas. All proposed alterations of tidal wetlands should be examined thoroughly by those familiar with the dynamics of wetland areas before disruptive activities are permitted.

PURPOSE

This publication lists and describes the general guidelines to be followed by the Marine Resources Division in evaluating applications to the U. S. Army Corps of Engineers for a permit to alter tidal wetlands. The broad purpose is to encourage communications between the Marine Resources Center and those proposing to alter tidal wetlands and thereby avoid some of the conflict presently surrounding many permit applications. By making these guidelines available in published form, we hope to (1) aid developers and others in taking advantage of state-of-the-art techniques in developing plans compatible with the marine environment, (2) aid the Marine Resources Division in avoiding policy deviations on similar permit applications over time, and (3) serve as a stimulus for the implementation of better and more consistent management efforts in tidal wetland areas, and thereby, encourage the wisest uses of marine resources.

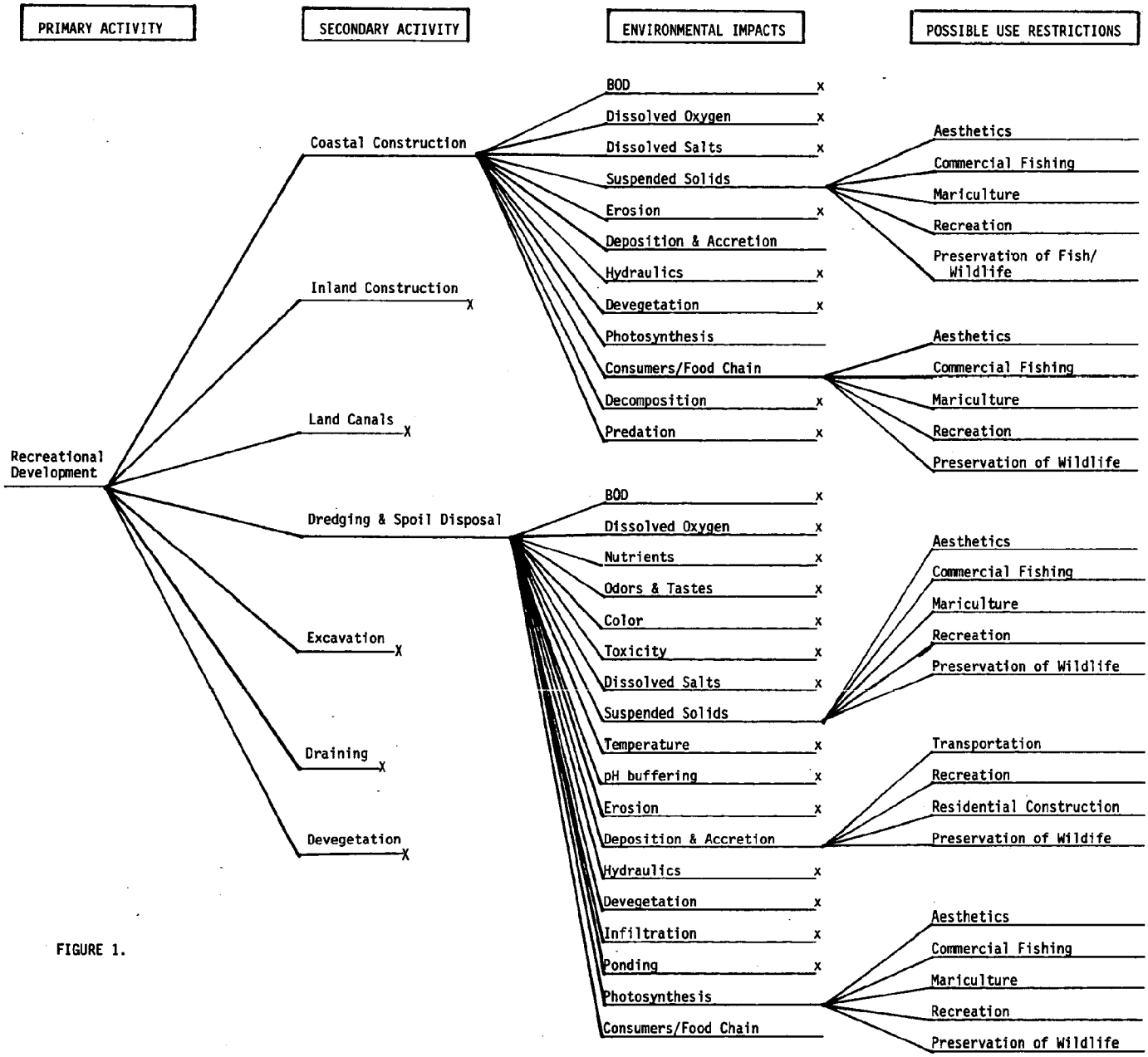
PRIMARY ACTIVITY
SECONDARY ACTIVITY
ENVIRONMENTAL IMPACTS
POSSIBLE USE RESTRICTIONS
Recreational Development
Coastal Construction
Inland Construction
Land Canals
Dredging & Spoil Disposal
Excavation
Draining
Devegetation
BOD
Dissolved Oxygen
Dissolved Salts
Suspended Solids
Erosion
Deposition & Accretion
Hydraulics
Devegetation
Photosynthesis
Consumers/Food Chain
Decomposition
Predation
BOD
Dissolved Oxygen
Nutrients
Odors & Tastes
Color
Toxicity
Dissolved Salts
Suspended Solids
Temperature
pH buffering
Erosion
Deposition & Accretion
Hydraulics
Devegetation
Infiltration
Ponding
Photosynthesis
Consumers/Food Chain
Aesthetics
Commercial Fishing
Mariculture
Recreation
Preservation of Fish/ Wildlife
Aesthetics
Commercial Fishing
Mariculture
Recreation
Preservation of Wildlife
Aesthetics
Commercial Fishing
Mariculture
Recreation
Preservation of Wildlife
Transportation
Recreation
Residential Construction
Preservation of Wildife
Aesthetics
Commercial Fishing
Mariculture
Recreation
Preservation of Wildlife

FIGURE 1.

PERMIT PROCEDURE

A permit from the U. S. Army Corps of Engineers is required for any type of construction or alteration activity in navigable waters, including the tidal wetlands of South Carolina. This responsiblity was assigned to the Corps of Engineers under the Rivers and Harbors Act of 1899.

Prior to submitting a permit application to the District Engineer for proposed activities over which the Corps has jurisdiction, an applicant must obtain a certification from the South Carolina Department of Health and Environmental Control[1] that the work will be conducted in a manner which will not violate applicable water quality standards. Upon receipt of this certification and permit application, the District Engineer issues a Public Notice to all concerned persons, including State agencies having responsibilities and interests in the proposed project.

All State agencies are requested to submit comments and recommendations within 30 days of the date of Notice to the South Carolina Water Resources Commission. The Commission is authorized by a directive from the Governor of South Carolina to coordinate comments from the various State agencies and to submit a recommendation to the Budget and Control Board. The Budget and Control Board expresses the State's position to the District Engineer regarding the granting of a permit.

The Marine Resources Division is charged with the broad responsibilities of protecting the public interest in respect to conservation and management of marine resources and advising on the maintenance and improvement of environmental quality as it affects these natural resources. In regard to this responsibility, the Office of Marine Conservation and Management evaluates each permit application individually, including individual and company applications as well as proposed work by Federal and State agencies requiring environmental impact statements.

Proposed projects are also evaluated by the Department's Game and Freshwater Fisheries Division and the Division of Law Enforcement and Boating. The comments of each Division are forwarded to the Office of Coastal Zone Planning, which drafts the Department's recommendation as to either approval or denial of the permit.

[1]See Appendix B for Public Agencies that have major responsibilities in coastal areas.

GENERAL GUIDELINES

Recognizing that tidal wetlands are of vital importance to the State, that these areas are, for the most part, state-owned property held in trust for the people generally, and that there is a strong and growing pressure for the development of these areas, the Marine Resources Center has established broad guidelines for permit applications in an effort to reduce the irreversible loss of productive wetland areas while meeting long-range state development needs.

Because of the importance of such areas, all development of state-owned wetlands should be avoided. In general, it is felt that any development adversely affecting wetlands should be in response to a recognized public need. Developments that do not will not be recommended for approval. Beyond this, those activities that can function only through use of waterfront property or access to it (e. g., marinas) has first priority for limited wetland development. Of second priority are those activities that could function inland, but for which a shoreline or wetland location would significantly enchance the activity on an economic or aesthetic basis. However, even in these cases, alterations of wetland areas should be strictly limited.

Any use altering wetland areas still must make every effort to minimize environmental impact and follow the specific guidelines discussed in other portions of this report. Uses not requiring a coastal location and those that are not economically enhanced to a significant degree by their proximity to the water are discouraged from wetland or waterfront locations since there are sufficient areas inland.

The Marine Resources Center feels that, if these guidelines were followed as a matter of State policy, (1) the relatively scarce developable waterfront and wetland areas would be allocated to those activities that can utilize them most effectively and (2) the environmental impact of development in the coastal areas would be lessened. It is hoped that other state agencies having advisory or management powers over waterfront or wetland areas will consider these guidelines in reviewing permit applications and that local governments will consider them in their development policies.

SPECIFIC PROJECT GUIDELINES

If a proposed project meets the conditions of the previously stated General Guidelines, the following specific project guidelines will be used when reviewing permit applications.

DOCKS AND PIERS

A dock or pier is a structure built over or floating on water, and is generally used for marine transportation or recreational purposes. Docks and piers are probably the most popular method of gaining access to deep water. They are also probably the least objectional from an ecological point of view. They do, however, sometimes pose navigational problems, restrict public use of the waters, and possess some potential for creating environmental problems. As a result, there are certain guidelines that should be followed in constructing such facilities.

Guidelines:

1. Docks and piers should not hinder navigation or public use of the waters.
2. Docks and piers should be constructed in a manner that does not restrict water flow.
3. The size and extension of a dock or pier should be limited to that required for the intended use.
4. The use of anchor buoys in preference to docks will be encouraged whenever practical.
5. Subdivisions, motels, and multiple dwellings will be encouraged to develop a single, joint-use moorage facility.
6. Project proposals should include facilities for the proper handling of litter, wastes, refuse, and petroleum products, where applicable.
7. Where docks and piers interfere with shellfish leases, the lessee should be contacted for approval.

MARINA LOCATION AND DESIGN

Marinas are facilities that provide boat launchings, storage, supplies, and services for small pleasure craft. There are three basic types of marinas: 1) the open structure type, where open pilework and/or floating breakwaters are used; 2) the solid construction type, where bulkheads and landfill are used to provide moorings and shelters; and 3) the dry storage type, where boats are stored in specially designed warehouses placed entirely on highland. All marinas affect the marine habitats to some degree, but adverse effects can be minimized by utilizing proper location and design features. In addition to guidelines for bulkheads and seawalls, docks and piers, dredging and filling, and navigation canals, the following guidelines are recommended:

Guidelines:

1. Marinas should be located in areas where maximum physical advantages exist and where least dredging and maintenance will be required.
2. Marinas should minimize the disruption of currents and the need for excavation of the shore area.
3. Open dockage extending to deep water should be constructed as an alternative to dredging for navigational access where feasible.
4. Turning basins and navigation channels should be designed to prevent long-term degradation of water quality. Dead end or deep canals without adequate flushing should be avoided.
5. Project proposals should include facilities for the proper handling of litter, wastes, refuse, and petroleum products.

TRANSPORTATION

There is often a strong public need for transportation projects. Unfortunately, such projects pose a significant potential for both direct and indirect degradation of the marine environment. However, properly planning transportation projects, considering environmental effects, can be an effective tool for guiding future coastal development toward more favorable end products.

Guidelines:

1. Major highways, freeways, and railways should be located inland from wetland areas, except in port and heavy industrial areas. Existing shoreline roads should not be expanded, but reserved for slow-moving recreational traffic.
2. In cases where coastal wetlands cannot be avoided, bridging should be used to the maximum extent possible to create road beds rather than filling and embankment. The project should be designed in a manner that does not invite additional filling of the waterfront for other purposes.
3. Where coastal wetlands are destroyed, some value for these lands should be included in the costs calculations for the project.[2]
4. Structures over water should be designed so as not to alter the natural water flow and circulation regimes and not cause excessive shoaling, as well as provide adequate clearance for commercial and pleasure craft.
5. Maximum care should be taken to prevent concentrated runoff from roadways from entering adjacent water bodies where possible.
6. Bridges should be designed, where appropriate, to provide for the enhancement of public access by the utilization of fishermen catwalks, boat launching ramps, or other structural features to enhance the recreational use of the facilities.

[2]Estimates for use in cost calculations will be provided upon request by the South Carolina Wildlife and Marine Resources Department.

BULKHEADS AND SEAWALLS

Bulkheads are retaining structures used to protect adjacent shoreline from the action of current or waves, or to make it more accessible. A common practice in the past has been to erect vertical seawalls out into the water and then place fill material on the landward side of the structure. This technique is often ineffective and very disruptive to marine productivity. Often more desirable practices are available.

Guidelines:

1. Except in special circumstances such as eroding shorelines, structures should be located no further channelward than the mean of the higher high water line, and designed so that reflected wave energy does not destroy stable marine bottoms or constitute a safety hazard.
2. Where possible, sloping rip-rap structures (open-piling) should be used rather than vertical seawalls.
3. Bulkhead construction should avoid sharp angle turns that may collect trash or cause shoaling or flushing problems.
4. In areas that have undergone extensive development, applications for bulkheads will be encouraged that esthetically and/or ecologically enhance the marine environment.
5. Applications for the construction of bulkheads on barrier and sand islands, where such will affect the natural deposition of sand materials, will normally be recommended for denial. To avoid this, extreme care should be taken as to the location and type of construction planned for bulkheads on such islands.

DREDGING AND FILLING

Development in coastal areas often has been considered synonymous with dredging and filling activities. Dredging and filling in shallow water areas always can be expected to have adverse environmental consequences. There are cases, however, where such environmental effects are unavoidable if legitimate public needs are to be met. There are also techniques that can be utilized to minimize these adverse effects and thus maximize total public benefits.

Guidelines:

1. Dredging and/or filling of tidal submerged lands should be kept to a minimum.
2. Dredging and filling for public projects in wetland areas should be undertaken only if the activity is water dependent and there are no feasible alternatives.
3. Dredge and fill activities will be prohibited in nursery areas and during periods of fish migration and activities related to the spawning and early development of important sport and commercial species.
4. Dredging and excavation should not create stagnant water conditions, deposit sumps, and lethal fish entrapments.
5. Designs for dredging and excavation projects should include protective measures such as silt curtains, diapers, and weirs to protect water quality in adjacent areas during construction by preventing the discharge of refuse, petroleum spills, and unnecessary dispersal of silt materials.
6. Where fill is necessary and diking is the best alternative, adequate diking should be constructed to contain fill material and prevent dispersal into adjacent wetland areas.
7. Excavation of materials from productive submerged or intertidal wetland areas for fill purposes are discouraged and will be recommended for approval only in unusual circumstances.

NAVIGATION CHANNELS AND ACCESS CANALS

A specialized form of dredging activities involves the creation and maintenance of navigation channels and access canals. These activities, as general dredging activities, have a potential for severe environmental impacts. However, techniques are available to alleviate a considerable portion of these impacts. Due to the importance of such projects in coastal areas, they have been singled out for special emphasis.

Guidelines:

1. To the extent feasible, project plans should utilize piers or catwalks to reach deeper water areas rather than channels or canals.
2. Access canals should be designed to ensure adequate flushing and should not create dead water or stagnant pockets.
3. Highland waterway construction that is slated to be tied into tidal wetland areas should be constructed in the dry, if possible, so that sloping and stabilization of the banks can be completed before the "plug" is removed for connection to open waters. Where dry construction is not possible, temporary dams or plugs in the ends of canals or waterways should be maintained until all sediment has settled out.
4. The sides of navigation channels and access canals should be gently sloping rather than vertical to facilitate biological as well as physical stabilization of the canal banks.
5. Dredging for navigational access should be well planned to prevent unnecessary channels. Where several landowners are to be served by a project, peripheral canals in the highland leading to a central navigational channel should be considered rather than separate access channels for each waterfront landowner.
6. The berm of access canals should be raised so that there is gradual slope away from the canal edge. This will help prevent introduction of contaminants into adjacent wetland areas.
7. Alignments of channels and canals should make maximum use of natural or existing channels.
8. Alignments of channels and canals should avoid shellfish beds and high productive wetland areas.

DEPOSITION OF SPOIL MATERIALS

The deposition of spoil materials resulting from the numerous dredging activities along the coast has important environmental effects separate from the original dredging activity. Thousands of acres of productive marine habitat have been destroyed by such depositions. Although some of these areas serve as limited bird and animal habitat, it has been very difficult to use them for any other purposes. Recognizing that there is a continuing need to dispose of spoil, it is important that plans for each additional disposal area pay careful attention to alleviating the adverse impacts on the marine environment.

Guidelines:

1. To the extent possible, all spoil material should be placed on suitable highland rather than in wetland areas.
2. Where this is not possible, disposal facilities should be constructed in relatively low production areas above the mean of the higher high water line.
3. Toxic and highly organic materials should be disposed of in highland areas behind impervious dikes unless detoxification is undertaken.
4. Dikes surrounding disposal areas should be vegetated immediately to prevent erosion.
5. Open water and deep water disposal should be considered as an alternative if highland alternatives are not feasible. Open and deep water disposal sites, however, should be seriously considered only after careful consultation with the Marine Resources Division and other relevant state and federal agencies.

JETTIES AND GROINS

Jetties and groins are structures used to stabilize beaches and other shorelines by modifying or controlling sand movement in longshore drift currents. Jetties are structures generally used to improve navigation in coastal inlets while groins are structures extending from the backshore across a beach. Such structures are rarely successful for long periods of time unless they are part of a comprehensive plan that considers shore processes affecting large stretches of shoreline. Because of interference with the downdrift of sand along the shore, isolated stabilization attempts generally cause more problems than they solve. For this reason, plans for all such structures should be carefully reviewed.

Guidelines:

1. Plans for jetties and groins should be analyzed to insure that the structure does not create adverse sand transportation patterns that induce erosion or undesirable shoaling in adjacent areas.
2. Projects will receive favorable emphasis if they alleviate or control erosion caused by man's activities, such as destruction of sand dune's, ocean front encroachment, and seawall and bulkhead construction.
3. In addition to adverse physical effects, care must be taken that jetties and groins do not interfere with public access.

CABLES, PIPELINES, AND TRANSMISSION LINES

Applications for the installation of aerial or submerged cables, pipelines, and transmission lines that are located and designed to provide compatibility with the environment will be recommended for acceptance. Particular emphasis will be placed on design of water quality protective measures, maintenance of tidal flushing action, maintenance and improvement of public access, and other measures to protect marine resources.

LAGOONS OR IMPOUNDMENTS

Applications for the construction of lagoons or impoundments for waste treatment facilities, solid waste disposal, and similar facilities will be recommended for denial when adverse effects of highly productive tidal wetlands are involved or the area is below the mean of the higher high water or if the discharge or runoff from such facilities would result in the closing of shellfish areas.

DRAINAGE CANALS OR DITCHES

Drainage canals or ditches can be important elements in highland development plans. If the quantity and quality of discharged waters does not adversely affect the tidal wetland environment in a significant manner, these applications will be recommended for approval. Also recommended for approval will be applications for the construction of drainage canals or ditches that follow the least damaging alignment and which meet one or more of the following needs: (a) insect vector control as a public health necessity, (b) other public health purposes, and (c) the control of urban runoff as part of a comprehensive flood plain management plan. Applications for the construction of drainage canals or ditches for the purpose of draining productive marine habitat will be recommended for denial unless there is an overriding public need of the first priority.

Guidelines:

1. Drainage canals and ditches should not create dead water or stagnant pockets.
2. The alignment of drainage canals, to the extent feasible, should avoid the more highly productive submerged or intertidal wetlands in the area.
3. Alignments of canals should make maximum use of existing deep water channels to avoid unnecessary excavation.
4. The quantity and quality of any discharged waters should not result in large alterations of the wetland environment.
5. All spoil material should be placed on suitable highland or where this is not possible, on low production areas above the higher of the mean high water line.

OTHER ALTERATIONS OF TIDAL WETLANDS

Because all possible wetland alterations can not be covered in a summary set of guidelines, it is recommended that individuals or groups considering wetland alteration activities not covered by specific guidelines (e.g., signs and billboards, mariculture impoundments, etc.) contact the Marine Resources Division as soon as feasible in their planning process so possible problems can be avoided.

EVALUATION OF PERMIT APPLICATIONS

South Carolina residents rely heavily on coastal areas for a great variety of uses — recreation, aesthetics, and resources like fish and shellfish, to name a few. An insult to this coastal system, however minor, will eventually be paid for by decreased value of the system to man. This does not mean that management policies in coastal areas are simply a matter of deciding on rules to perserve the marine ecosystem. Rather, it is necessary to consider broad trade-offs among environmental and social and economic values in a manner that adequately recognizes the long term effects of proposed actions.

As mentioned earlier, one purpose of these guidelines is to aid the Marine Resources Division personnel in evaluating such trade-offs in a manner which avoids policy deviations from area to area and over time. To further this objective, Division personnel will ask the following general questions when evaluating specific permit applications:

1. Does the proposed project appear to meet a recognized public need?
2. Is the proposed activity generally compatible with surrounding activities?
3. Does the activity described in the permit application require waterfront or wetland property or access to it to function properly?
4. Does a shoreline or wetland location enhance the activity on an economic or aesthetic basis?
5. What types of environmetal alteration would result from the proposed work?
6. Does the proposed project indicate that the guidelines are to be followed for specific alterations? If not, how does the proposed project differ and what are the probable effects of this?
7. What is the biological importance to marine resources of the area to be affected by the proposed project (hatitat, productivity, water quality, etc.)?
8. What will be the effect of the proposed project on production and utilization of important sport and commercial species?
9. What will be the probable effect on related marine activities (e.g. photography, research, pleasure boating, etc.)?
10. What additional environmental safeguards should be built into the proposed project?

APPENDIX A

Information Describing Proposed Works

To faciliate the processing of a permit application, the following items of information that are applicable to a particular project should be submitted in conjunction with a permit application. Most of these items are already required by the U. S. Army Corps of Engineers on permit applications. The more detail about a project included with the permit application, the faster a review can be made, problem areas identified, and solutions found.

1. Scale drawing of reasonable size of the proposed project indicating Federal harbor lines.
2. Overall map (U. S. Coast and Geodetic Survey, coast charts, or State road maps) showing project location.
3. Location and dimensions of all areas to be excavated and filled.
4. Method(s) of excavation, type of equipment to be used, and means of equipment access to the construction site.
5. Type and quantity of materials (cubic yards) to be excavated.
6. Extreme high lunar tide, mean of the higher high water, mean high water, and mean low water lines in the project area, where possible.
7. Water depths in the vicinity of the proposed project.
8. Direction and magnitude of water current in river areas and ebb and flood tides to the extent possible.
9. Intended use of filled area(s), including nature and type of buildings, facilities, and structures.
10. The applicant's total plan of development including long-range plans, type and location of sewage treatment facilities and effluent outlets, volume and characteristics of all effluent discharges (solid and liquid).
11. Previous Department of the Army permits issued for the project area and immediate adjacent areas, if any.
12. Statement as to the necessity of a particular dredging depth and width.
13. Provisions for public access within proposed project area.
14. Rate of shoreline erosion or accretion, if known.
15. Erosion control plans to stabilize areas influenced by project construction.
16. Detailed drawing showing typical cross sections of retaining dike and spillway structures to be used to contain spoil materials.
17. Location of freshwater outflows, such as aquifers and springs, where known or identified.
18. Maximum recorded hurricane and storm tides in project area.

APPENDIX B

Enforcement

One of the difficulties of using a permit system to manage tidal wetland areas is identification of illegal or unpermitted activities. Recognizing this, the South Carolina Wildlife and Marine Resources Department has initiated an aerial surveillance program that is designed to prevent illegal filling, dredging, diking, and destruction of tidal wetlands below the high of the mean high water. This surveillance program will provide the State with weekly information on the status of development activities in tidal wetland areas.

Aerial Surveliance

The aerial surveillance of tidal wetlands is in conjunction with coastal patrols for commercial fishing violations. A minimum of three patrols are made each week with one each from the Georgetown, Charleston, and Beaufort areas. One Conservation Officer is assigned to the flights from each of the above areas.

On each flight, forms are filled out that indicate if any type of landfill, dredging, or dragline operations are being carried out that appear to be below the high of the mean high water mark, or if no suspect operations were observed. Completed forms are filed with the Office of Marine Conservation and Management of the Marine Resources Division and the Division of Law Enforcement and Boating.

Enforcement Procedure

Upon observing any type of landfill, dredging, diking, or other operations altering tidal wetlands that appear to be below mean high water, the observer shall radio the Marine Resources Division at Fort Johnson to determine if a permit has been issued.

The U. S. Army, Corps of Engineers, will be notified to determine if a federal permit has been issued. The Corps will be requested to investigate the matter.

If the operation seems questionable an on-site check shall be made by a Conservation Officer. Names and addresses of the owner of the property, the contractor, and the machine operator will be included in the Officer's report. The Office of Marine Conservation and Management will be notified immediately of any questionable operation and qualified personnel (survey teams, biologist, etc.) will be dispatched to see if legal action is advisable.

If legal action is required, it will be brought by the Office of Marine Conservation and Management with support from the Law Enforcement Section, in conjunction with the assistance of the office of the Attorney General.

APPENDIX C

Public Agencies

The following public agencies are concerned with the general problems of wetlands and are interested in specific problems as they relate to their particular interest. For information in specific areas, contact:

South Carolina Wildlife & Marine Resources Department
Marine Resources Division
P. O. Box 12559
Charleston, S. C. 29412

South Carolina Department of Health & Environmental Control
Owen Building
1321 Lady Street
P. O. Box 11628
Columbia, S. C. 29211

South Carolina Water Resources Commission
700 Knox Abbott Drive
Cayce, South Carolina

U. S. Army Corps of Engineers
Charleston District
P. O. Box 919
Charleston, S. C.

U. S. Bureau of Sports Fisheries & Wildlife
Field Supervisor
Fish & Wildlife Service
Room 468
310 New Bern Drive
Raleigh, N. C. 27601

U. S. Envirnomental Protection Agency
1421 Peachtree Street, N. E.
Atlanta, Georgia 30309