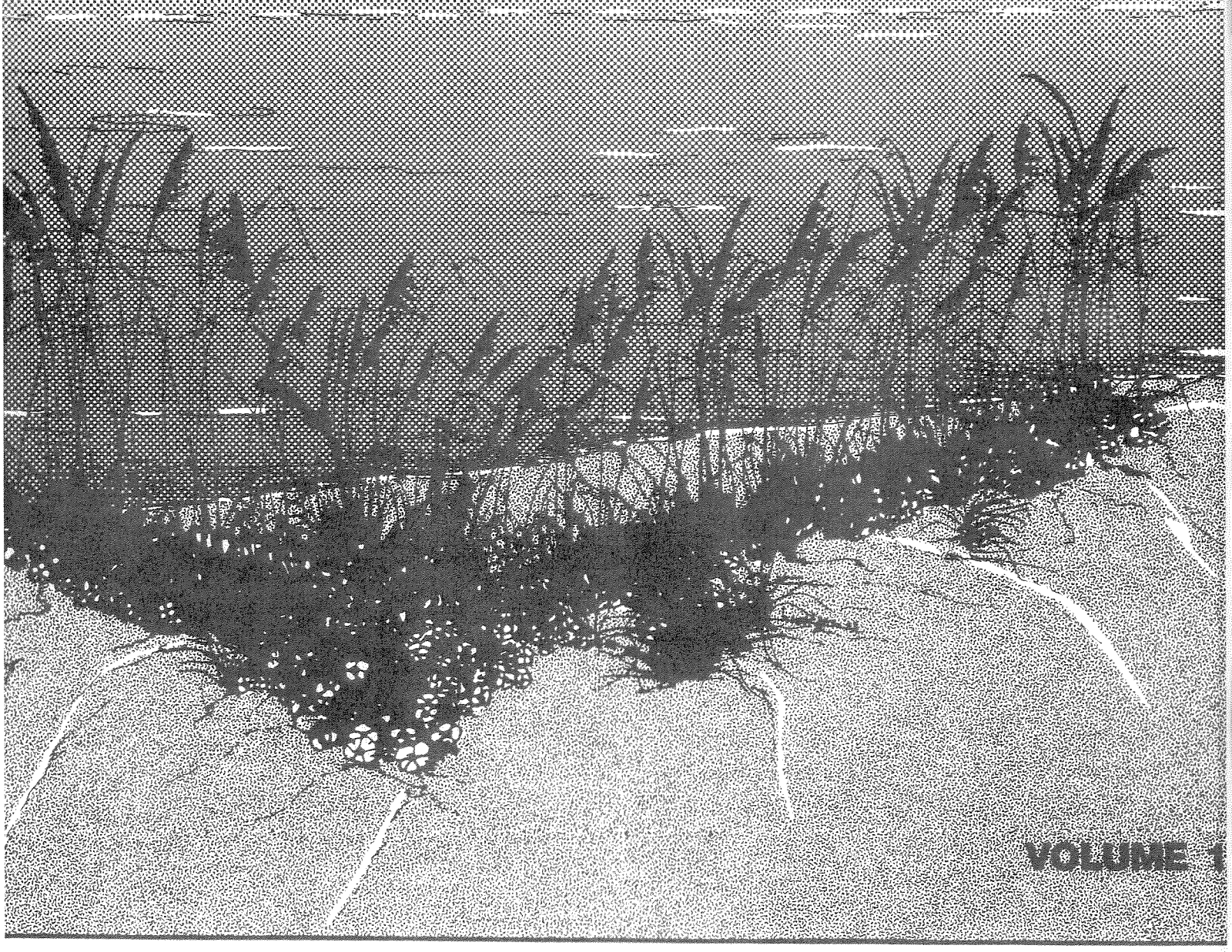
REPORT TO CONGRESS: COASTAL BARRIER RESOURCES SYSTEM

With Recommendations

As Required by Section 10 of Public Law 97-348, the Coastal Barrier Resources Act of 1982



VOLUME 1

U.S. Department of the Interior

REPORT TO CONGRESS:
COASTAL BARRIER RESOURCES SYSTEM

With Recommendations

As Required by Section 10 of Public Law 97-348,
the Coastal Barrier Resources Act of 1982

Volume 1

Mapped, edited, and prepared by the Coastal Barriers Study Group

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PREFACE

This report has been prepared in accordance with Section 10 of Public Law 97-348, the Coastal Barrier Resources Act of 1982, which states:

Sec. 10. Reports to Congress.

(a) In General.--Before the close of the 3-year period beginning on the date of the enactment of this Act, the Secretary shall prepare and submit to the Committees a report regarding the System.

(b) Consultation in Preparing Report.--The Secretary shall prepare the report required under subsection (a) in consultation with the Governors of the States in which System units are located and with the coastal zone management agencies of the States in which System units are located and after providing opportunity for, and considering, public comment.

(c) Report Content.--The report required under subsection (a) shall contain--

(1) recommendations for the conservation of fish, wildlife, and other natural resources of the System based on an evaluation and comparison of all management alternatives, and combinations thereof, such as State and local actions, (including management plans approved under the Coastal Zone Management Act of 1972 (16 U.S.C 1451 et seq.)), Federal actions (including acquisition for administration as part of the National Wildlife Refuge System), and initiatives by private organizations and individuals;

(2) recommendations for additions to, or deletions from, the Coastal Barrier Resources System, and for modifications to the boundaries of System units;

(3) a summary of the comments received from the Governors of the States, State coastal zone management agencies, other government officials, and the public regarding the System; and

(4) an analysis of the effect, if any, that general revenue sharing grants made under section 102 of the State and Local Fiscal Assistance Amendments of 1972 (31 U.S.C. 1221) have had on undeveloped coastal barriers.

Under the direction of the Assistant Secretary for Fish and Wildlife and Parks, this report has been prepared by the Coastal Barriers Study Group, a task force of professionals representing the National Park Service, Fish and Wildlife Service, U.S. Geological Survey, and other Departmental offices. Several other Federal agencies have been consulted in this effort, including the U.S. Army Corps of Engineers, the Department of the Treasury, and the Federal Emergency Management Agency.

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CONTENTS

	Page
PREFACE	iii
FIGURES	ix
TABLES	x
CHAPTER 1. INTRODUCTION	1
Background	1
CBRS Section 10 Report	3
CHAPTER 2. A PHYSICAL CHARACTERIZATION OF COASTAL BARRIERS	5
Coastal Barriers Along the Atlantic and Gulf of Mexico Coasts	5
Sea-level rise, barrier formation, and barrier adjustment	7
Discussion of regional physical characteristics	13
Coastal Barriers Along Puerto Rico and the U.S. Virgin Islands	31
Physical characteristics of the islands	31
Unique features of coastal barriers in the Caribbean	32
Coastal Barriers Along Other Coastlines of the United States	32
CHAPTER 3. AN ECOLOGICAL EXAMINATION OF COASTAL BARRIERS	33
Coastal Barriers Along the Atlantic Ocean and Gulf of Mexico Coasts	33
The ecosystems	33
Regional presentation of fish and wildlife resources	41
The value of coastal barriers and associated aquatic habitats	61
Human impacts on coastal barriers	66
Coastal Barriers Along Puerto Rico and the U.S. Virgin Islands	70
The ecosystems	70
Fish and wildlife values	74
Human impacts on Caribbean coastal barriers	77
Coastal Barriers Along Other Coastlines of the United States	78
CHAPTER 4. The CBRA: THE LIMITATION OF GOVERNMENT EXPENDITURES ON COASTAL BARRIERS	79
Prohibited Federal Expenditures	79
Federal flood insurance	80
Other restricted programs	80
Financial Assistance Allowed Under the CBRA	84
Section 3: exceptions in the definition of financial assistance	84
Section 5(a)(3): certain erosion control projects	85
Section 6(a)(1)-(5): exceptions requiring consultation but not consistency with the purpose of the CBRA	85
Section 6(a)(6): exceptions requiring consultation and consistency with the purposes of the CBRA	87

Page

Implementation 90
Federal agency compliance 90
OMB certification 91
Consultation 91
Recommendations 92
Section 5 Limitations 92
Section 6 Exceptions 93
Federal agency compliance and block grants 94
Section 7-OMB Certification 94

CHAPTER 5. EXPANSION OF THE DEFINITION AND DELINEATION OF COASTAL BARRIERS AND RECOMMENDATIONS FOR ADDITIONS TO OR DELETIONS FROM THE CBRS 99
Evolution of the Definition and Delineation of Coastal Barriers 99
Development of coastal barrier definitions and delineation criteria 99
Development status 101
Protected status 103
Other coastlines 105
Definition of Undeveloped Coastal Barriers for Purposes of This Report 105
General definition 105
Types of coastal barriers 106
Composition of coastal barriers 106
Factors that shape coastal barriers 108
Associated aquatic habitat 108
Undeveloped 109
Delineation of Undeveloped Coastal Barriers for Purposes of This Report 110
Delineation of landward boundary 110
Delineation on seaward side 112
Delineation of undeveloped barriers 113
Recommendations for Additions to or Deletions from the CBRS 113
Definition of coastal barriers 113
Geographic scope 114
Associated aquatic habitat 115
Navigation channels 115
Secondary barriers 116
Otherwise protected coastal barriers 116
Military and Coast Guard lands 117

CHAPTER 6. AN OVERVIEW OF ALTERNATIVES FOR CONSERVING FISH AND WILDLIFE RESOURCES OF THE CBRS 126
Introduction 126
Federal Stewardship 126
State Coastal Conservation Programs 127

CHAPTER 7. ACQUISITION ON COASTAL BARRIERS 130
The Land and Water Conservation Fund 131
The National Wildlife Refuge System 131

Page

State and Local Acquistion 134
Surplus or Excess Federal Property 135
Recommendations 136

CHAPTER 8. REGULATORY PROGRAMS ON COASTAL BARRIERS 139
Federal Regulatory Authority 139
State Regulatory Programs 144
Recommendations 145

CHAPTER 9. TAX POLICY ON COASTAL BARRIERS 146
Introduction 146
The Tax Code and Coastal Barriers 148
Tax options that could reduce the incentive to develop coastal barriers 148
Tax options that could increase the incentive to conserve coastal barriers 153
Dynamics of tax options 159
The Tax Changes in 1986 and Tax Policy Options 160
Recommendations 161

CHAPTER 10. THE IMPACT OF FEDERAL GENERAL REVENUE SHARING FUNDS ON UNDEVELOPED COASTAL BARRIERS 162
Purpose of the Survey 162
Methods of Study 163
Findings 163
Analysis 164
Conclusions 165

CHAPTER 11. CONSERVATION OF COASTAL BARRIERS: THE NEXT STEP 166
Recommendations 170

REFERENCES 172

COMMENT LETTERS 177
Federal Agencies 178
State and Local Governments 186
Organizations 195
Individuals 256

FIGURES

Number		Page
1	Barrier classification as a function of the tide range and mean wave height	6
2	Major sand sources along the Gulf of Mexico coast	8
3	Comparative cross-sectional sketches of high- and low-profile barrier islands	9
4	Marsh outcrops on the beach at Sargent Beach, Texas, on the flanks of the Brazos-Colorado deltaic headland	10
5	Vertical aerial photos of Dauphin Island, Alabama, after Hurricane Frederic	11
6	Undermining by Hurricane Allen at Mustang Island, Texas	12
7	Map of the United States showing the coastal regions discussed in this chapter	14
8	Annual hurricane landfall probabilities in the United States	16
9	Generalized cross-section of coastal barrier ecosystems	34
10	Atlantic coast of United States showing various coastal regions	47
11	Gulf coast of United States showing various coastal regions	48
12	Barrier island formation by sand spit accretion	62
13	Typical sand beach ecosystem showing relationship of component habitats	71
14	Mangrove dominated ecosystem with lagoonal flats and protective reef	72
15	Four examples of coastal barriers along the Atlantic and gulf coasts	107
16	Landward boundary delineation in common coastal barrier settings	111

TABLES

Number		Page
1	Common ecosystems and special features found in each region along the Atlantic and Gulf of Mexico coasts	42
2	U.S. Fish and Wildlife Service's National species of special emphasis and endangered and threatened species and their associated coastal barrier ecosystems	43
3	U.S. Fish and Wildlife Service's National species of special emphasis and endangered and threatened species and their associated coastal barrier ecosystems	45
4	U.S. Fish and Wildlife Service's National species of special emphasis and endangered and threatened species associated with coastal barriers in Puerto Rico and the U.S. Virgin Islands	75
5	Summary of public comments received on amendments to Section 5 and 6 of the CBRA	96
6	Summary of public comments received on technical assistance, block grants, and Section 7--OMB certification	97
7	State and Territory positions on technical amendments to the CBRA	98
8	Summary of public comments received on expanding the geographic scope of the CBRS	119
9	Summary of public comments received on associated aquatic habitat, secondary barriers, and military and Coast Guard lands	121
10	Summary of public comments received on otherwise protected barriers and privately owned inholdings on those barriers	123
11	State and Territory positions on proposed additions to and deletions from the CBRS	124
12	Summary of recommendations for changes in the CBRS	125

Number		Page
13	Summary of public comments received on acquisition, regulatory, and tax law amendments	138
14	Summary of public comments received on a joint study of post-storm reconstruction alternatives and education about coastal barrier hazards	171

CHAPTER 1

INTRODUCTION

The U.S. shoreline bordering the Atlantic Ocean and Gulf of Mexico contains one of the longest and best defined chains of coastal barriers in the world. The chain contains over 400 barriers and totals about 2,700 miles (mi) of shoreline. These coastal barriers contain and protect resources of extraordinary scenic, scientific, recreational, natural, historic, and economic value which can be damaged by development on them or adjacent to them. In recognition of this fact, the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.) was enacted in October 1982. This Act established the Coastal Barrier Resources System (CBRS) consisting of 186 coastal barrier units along 670 mi of shoreline on the Atlantic and Gulf of Mexico coasts. These units represent areas that were undeveloped and unprotected in 1982. Most Federal revenues that promote economic growth or development are no longer available for use in the CBRS.

The philosophy behind the CBRA is that the risk associated with new development in these areas should be borne by those who choose to live and work along the coast, and not by all American taxpayers. By restricting Federal expenditures and financial assistance on specific undeveloped coastal barriers, the Federal Government can minimize the loss of human life, reduce the wasteful expenditure of Federal revenues, and reduce the damage to fish and wildlife and other natural resources that can accompany development of these fragile areas. These are the stated purposes of the Coastal Barrier Resources Act (Section 2(b)). Section 10 of the CBRA directs the Department of the Interior to study the CBRS and prepare for Congress a report which includes recommendations for changes in the CBRS based on an evaluation of management alternatives that would foster conservation of the natural resources of the CBRS.

BACKGROUND

The Coastal Barrier Resources Act was the culmination of several years of study by Congress and the Department of the Interior (DOI) of Federal programs and how they affect the development of coastal barriers. Studies initiated by the DOI in 1977 assessed options for modifying about 40 Federal programs affecting coastal barriers, including the National Flood Insurance Program. The results of these studies were released in a draft Environmental Impact Statement (EIS) in January 1980. Congressional action followed to redirect partially the economic risk of development back to the private sector.

Section 341 of the Omnibus Budget Reconciliation Act of 1981 (OBRA) amended the National Flood Insurance Act of 1968 to prohibit the issuance of new Federal flood insurance coverage after October 1, 1983, for any new construction or for substantial improvements of structures located on undeveloped coastal barriers. The OBRA gave the Secretary of the Interior a twofold responsibility: (1) to designate coastal barriers based on a definition provided in the Act, and (2) to report to Congress with recommendations (if any) relating to the term "coastal barrier."

In accordance with the OBRA, the Secretary submitted a report to Congress on August 13, 1982. The definitions and delineation criteria and a listing of 188 units proposed for designation as undeveloped coastal barriers were published in the August 16, 1982 Federal Register (47(158):35696-35715). The Secretary's report to Congress endorsed the general definitions and delineation criteria contained in the OBRA and recommended that implementation of the OBRA proceed. The action recommended in this August 1982 report to Congress was identical to the Proposed Action of the 1980 EIS.

After the Secretary delivered his 1982 report to Congress but before final CBRA implementation, Congress enacted the CBRA which established the 186 units in the CBRS and prohibited all new Federal expenditures and financial assistance within the CBRS, with certain specific exceptions. Section 10 of the CBRA requires this report and is discussed in the following portion of this introduction. Section 11 of the CBRA repealed Section 341 of the OBRA, eliminating the requirement that the DOI make final designations of undeveloped coastal barrier units where only Federal flood insurance would be prohibited.

A Final Environmental Statement (FES) was issued in May 1983, seven months after the enactment of the CBRA. It assessed the environmental consequences of four alternatives considered in the planning process between January 1980 and October 1982. A large part of the High Level Protection Alternative (the Proposed Action) was incorporated into the CBRA. The definitions used in the CBRA are consistent with the definitions used in the OBRA and the delineations of undeveloped coastal barriers in the existing CBRS are generally consistent with those proposed by the Secretary of the Interior in his August 1982 report to Congress.

While the CBRA reflects the Proposed Action in the FES in terms of geographic coverage, it expands the Federal prohibition from just Federal flood insurance to include all Federal programs that expend funds or provide financial assistance in support of development, unless specifically exempted or permitted by the CBRA. The High Level Protection Alternative was written pursuant to enactment of the CBRA and in cognizance of the Section 10 requirement to prepare this report. Subsequently, the DOI prepared a supplemental Legislative Environmental Impact Statement (LEIS) to assess the specific environmental and economic impacts of the DOI's recommendations to Congress.

The draft Supplemental LEIS was released for public comment on February 1, 1988 (Federal Register 53(20):2792). Comments were accepted through March 17, 1988. The LEIS considered two alternatives: the Proposed Action, essentially the recommendations contained in this report, and No Action. Under the Proposed Action, more than 790,000 acres, of which about 39,000 acres are

fastland, would be added to the CBRS along the Atlantic and Gulf of Mexico coasts. Under the No Action alternative, no changes would be made in the existing CBRS.

CBRS SECTION 10 REPORT

The Coastal Barrier Resources Act Section 10 study began in 1983. In January, a meeting was held with interested Congressional staff and special interest groups to discuss the scope of the study. Four regional coordinators were then appointed by the National Park Service to work with the coastal states to obtain information on coastal barriers in different geographic areas. On October 19, 1983, the Governors of all the coastal states received a letter from the Secretary of the Interior notifying them of the study and asking them to name a State coordinator. On December 5, 1983, an outline of the proposed study and request for comments on that outline were published in the Federal Register (48(234):54543-54545). The Department accepted public comments on this study plan through February 1, 1984.

During 1984, the Coastal Barriers Study Group, a task force of professionals representing the National Park Service, the Fish and Wildlife Service, U.S. Geological Survey, and other Departmental offices, prepared a draft inventory of coastal barriers along all U.S. coastlines. All State coordinators were requested to review these draft maps and arrange meetings with Study Group members. Meetings were held in 21 of the 29 affected States to review the draft maps.

On March 4, 1985, the draft national inventory maps were released for public comment. Copies of the maps were sent to all affected States and members of Congress. A briefing was held for interested Congressional staff. On May 1, 1985, the draft text report "Coastal Barrier Resources System Draft Report to Congress" was released for public comment. This report outlined the conservation alternatives that were available for the CBRS. Copies of the report were mailed to all affected States. The States were also notified that Study Group members were available for participation in State public meetings. Twenty-six meetings in ten States were scheduled by the States and attended by members of the Study Group.

On September 30, 1985, the public comment period was closed. The DOI received over 2,300 comments on the draft inventory and report. A wide variety of viewpoints were expressed on the possibility of expanding the CBRS to include other coastlines, protected barriers, secondary barriers, and associated aquatic habitat. A variety of opinions were also expressed on the conservation alternatives.

After reviewing the public comments received and the information gathered, the DOI formulated proposed recommendations to Congress. On March 25, 1987, a second draft report containing these proposed recommendations and maps of all the proposed changes in the CBRS was released. Public comments on this second draft report were solicited through the Federal Register and Congressional and

press briefings were held. The draft report and map atlases were mailed to all affected members of Congress, State governors, counties, and special interest groups. A notice of the availability of the report was mailed to all 2,300 commenters on the 1985 draft report. Again, all States were notified that members of the Study Group were available for public meetings. Eleven meetings in three States were attended. Public comments on the draft report were accepted for a 90-day period, closing June 23, 1987. More than 6,150 individuals commented on the report. As previously, a wide variety of opinions were expressed on the proposed recommendations.

The final report to Congress has been prepared as a 22-volume compendium with 4 appendixes. This volume of the report describes the CBRS and discusses and presents recommendations on the conservation alternatives for the CBRS. It is a revised version of the document released in the Spring of 1985 ("Coastal Barrier Resources System Draft Report to Congress") discussed above.

Volumes 2-22 of the report contain background information about the coastal barriers in each State or Territory and maps and specific recommendations for additions to, or deletions from, the CBRS in those States or Territories. Appendix A is a report on shoreline change and wetland loss in the CBRS and Appendixes B, C, and D are reports containing preliminary and general information about the coastal barriers of the Great Lakes, Hawaii and American Samoa, and the Pacific Coast, respectively.

CHAPTER 2

A PHYSICAL CHARACTERIZATION OF COASTAL BARRIERS

COASTAL BARRIERS ALONG THE ATLANTIC AND GULF OF MEXICO COASTS

The coastal barriers from Maine to Texas show a high degree of regional diversity. This diversity is controlled by differences in climate and in the physical processes shaping barrier shorelines. The dominant physical factors responsible for molding coastal landforms are (1) tidal range, (2) wave energy, and (3) sediment supply from rivers and older, preexisting coastal sand bodies. Relative changes in local sea level also profoundly affect coastal barrier diversity. This section will describe in a semi-quantitative way the regional variations in the geological features of barrier coastlines.

A classification of coastal barriers based upon the relative magnitude of tidal and wave energies has been established by Davis and Hayes (1984) and is widely accepted by the scientific community (Figure 1). Depositional coastlines can be classified as wave-dominated, tide-dominated, or mixed. Other important attributes can be expressed as qualifiers of these terms. The differences in the landforms associated with a tide-dominated versus a wave-dominated coastline reflect the relative ability of the tidal currents to transport sediments versus the ability of wave-generated longshore currents to transport sediments.

Along wave-dominated coasts, longshore currents produce long, continuous barriers with small ebb-tidal deltas (sand bodies seaward of inlets) because the waves rapidly disperse the sediment. Sediment carried landward into inlets by tidal currents, however, accumulates in large flood-tidal deltas (sand bodies landward of inlets) because these areas are sheltered from wave dispersal. With an increase in tidal range, the tidal currents through the inlets increase in velocity. Ebb tidal currents transport large quantities of sand seaward; consequently, tide-dominated coastlines support large ebb-tidal deltas. These ebb-tidal deltas in turn supply sediment to the downdrift beaches. As the sediment moves from the updrift tidal delta "source" towards the down-drift tidal inlet, the intervening beach serves as a conveyor belt, transferring sediment from one tidal delta to another. If more sediment enters this conveyor belt than leaves it, the beach will accrete (grow). If the opposite is true, it will erode.

The capacity for onshore-offshore sediment transport increases with the tidal range. In areas of high tidal range, the wave energy is distributed across a wide intertidal zone during the tidal cycle. The result is that tide

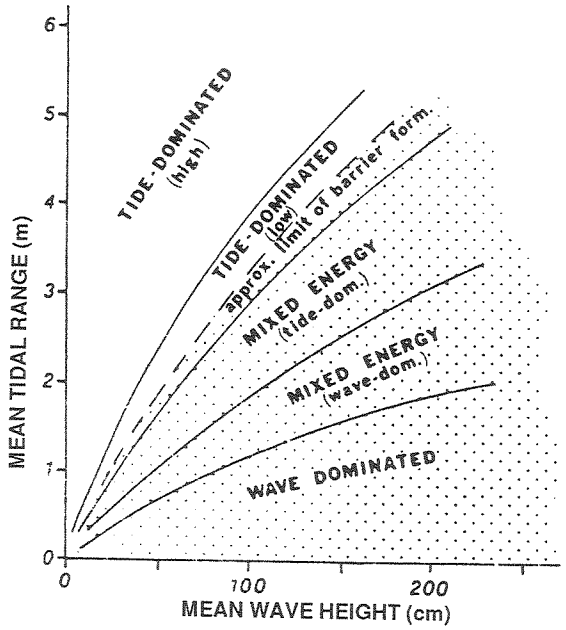


Figure 1. Barrier classification as a function of the tidal range and mean wave height. Nineteen barrier island shores in North America and Western Europe were used as a basis for this diagram (from Davis and Hayes 1984).

dominance is strong enough to completely eliminate barrier islands in some locations, apparently regardless of the level of wave energy. On a worldwide basis, barrier islands generally do not exist along coasts where the tidal range is more than 13 ft. Such coastlines are rare along the contiguous United States, but are common in Alaska and other parts of the world.

The barrier islands along the south Texas coast typify the wave-dominated coastline: they are long, generally narrow, and cut by widely separated tidal inlets with large sand accumulations in the back-barrier bays (flood-tidal deltas), and small or nonexistent seaward shoals (ebb-tidal deltas). The mean tidal range along this coast is about 1.5 ft; the mean annual breaker height is about 2 ft. Similar wave-dominated barrier islands are also the rule for parts of Louisiana, the Florida panhandle, southeast Florida, North Carolina's Outer Banks, the south shore of Long Island, and the Cape Cod segment of the Massachusetts coast.

The barrier islands along the Georgia coast typify a tide-dominated coastline: they are relatively short and stubby and are separated by stable tidal inlets with an average spacing of 9 mi. All inlets here have large ebb-tidal deltas. The mean tidal range along the Georgia coast is about 6.5 ft; the nearshore mean annual breaker height is about 1 ft. Tide-dominated coastlines also are found adjacent to Georgia in northeast Florida, along most of South Carolina's coast, along the Delmarva Peninsula, and in Massachusetts. Some Louisiana and upper Texas coast barriers also have a tide-dominated shape (Grand Isle, Galveston Island) in spite of a tidal range of less than 1.5 ft. The tide dominance in these areas is due to the large volume of water being exchanged between the Gulf of Mexico and such major embayments as Barataria and Galveston Bays.

It is important to recognize that barriers are continuously evolving components of a large-scale coastal "sand-sharing" system. Changes in the system at one place affect the entire barrier chain. This linkage between barriers is most readily observed near tidal passes where sand from an updrift beach is transferred to the downdrift island through a series of complex interactions between waves and currents. A disturbance in an inlet invariably affects the stability of the adjacent beaches.

Sea-Level Rise, Barrier Formation, and Barrier Adjustment

The origin of coastal barriers has been a matter of debate among coastal geologists for many years, and barriers in different coastal regions probably formed in different ways. Three major factors, however, appear to be directly related to how barriers form and how they continue to change over time: (1) the relative change in sea level, (2) the magnitude of natural processes in a region, and (3) the amount and type of sediment available in a region (Dolan et al. 1980).

Since the melting of the last continental ice sheet some 15,000 years ago, global sea level has been rising. As a consequence, the entire U.S. shoreline has been displaced landward up the gentle slopes of the Atlantic and gulf coastal plains to its present position. Fifteen thousand years ago, the shoreline was located near the edge of the Continental Shelf. Over the ensuing 10,000 years, global sea level rose more than 300 ft and the ocean pushed large sandy beach ridges landward.

As sea-level rise slowed about 5,000 years ago, waves, tides, and winds formed the coastal barriers close to the present shorelines. Where glacial headlands existed, sediments were transported along the shore to form barrier spits and bay barriers. In some areas dune ridges along the coast were isolated from the mainland and became barriers as the sea slowly drowned the lowlands behind the ridges, turning them into lagoons and marshes. The Sea Islands of South Carolina and Georgia probably formed this way. About 4,000 years ago, the gulf coast appears to have consisted of a series of deltaic headlands that enclosed interdeltaic bays (Figure 2). Waves striking this coast generated longshore currents which transported sand from the deltaic headlands laterally into both adjacent embayments. The headlands retreated, continously releasing sand from the eroding shoreface and delivering this material to the interdeltaic barriers. As a result, barriers between deltas along the gulf coast are wide

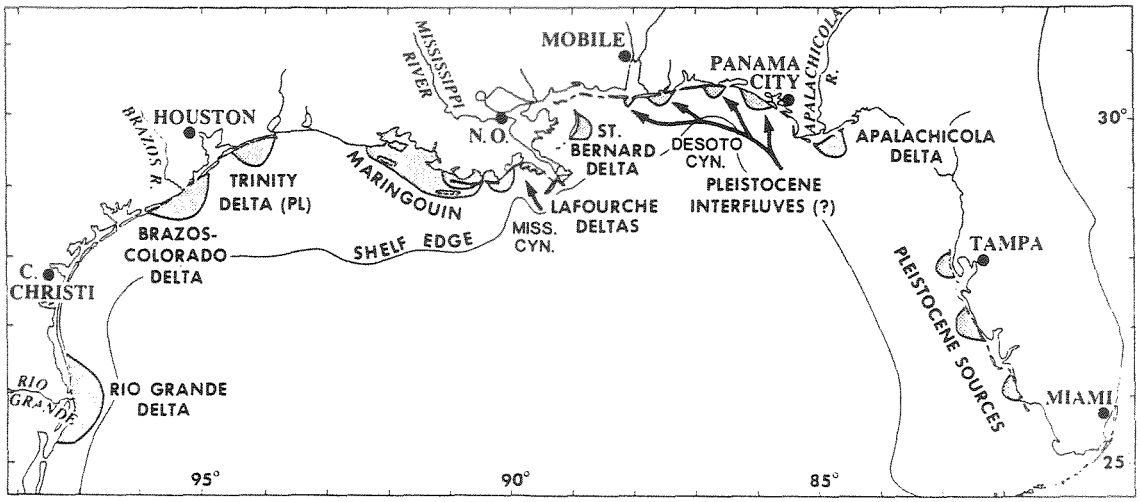


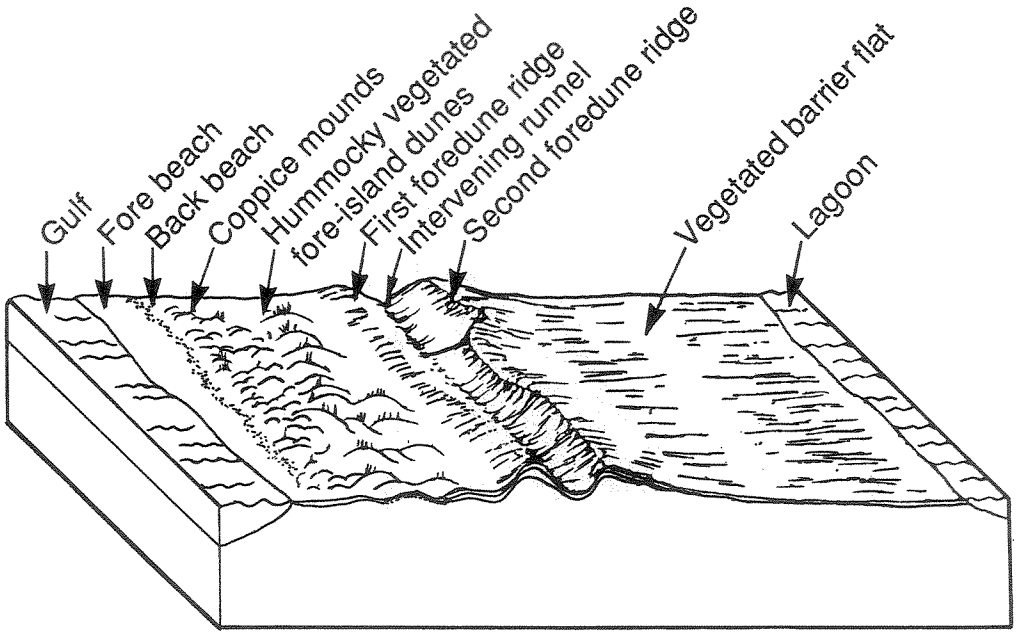
Figure 2. Major sand sources along the Gulf of Mexico coast. Along the central and western gulf coast, the available barrier sand sources are active deltas. Along the eastern gulf coast, sand is derived from eroding sand ridges and abandoned deltaic deposits.

and accreting. Commonly, accreting barriers consist of beach and dune ridges parallel to the shore, reflecting the episodic nature of their growth.

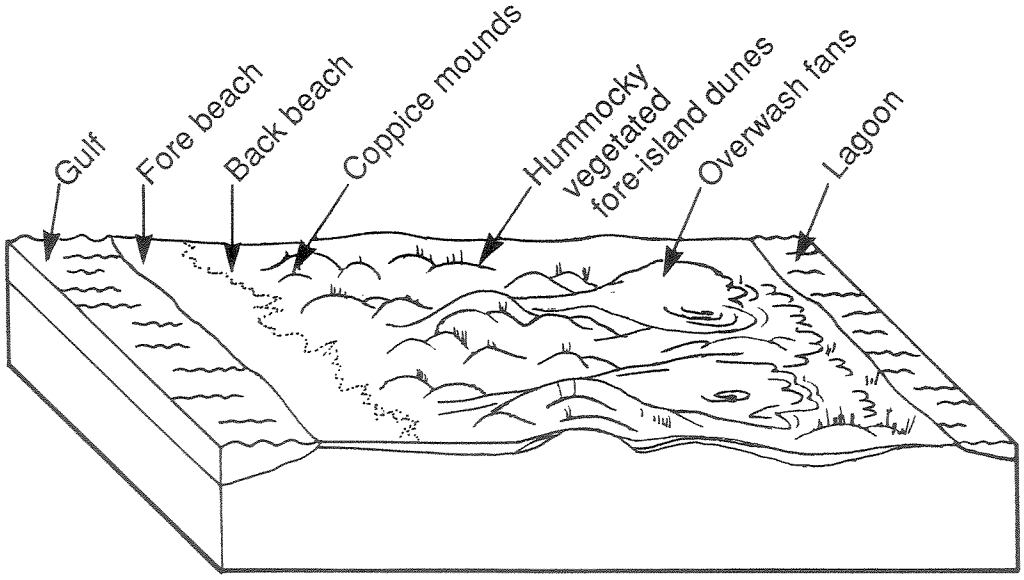
Two contrasting barrier landforms have developed as a consequence of this evolutionary pattern: the low-profile and the high-profile barrier (Figure 3). Low profile barriers are characterized by a single, low (<20 ft above mean sea level) dune ridge and are found along erosional headlands. Much of the sand that is mined by the waves along these shorefaces is transferred downdrift, out of the local area. Only minor amounts of sand are piled up into narrow and thin washover sheets during storms and erosion rates are generally high (Figure 4). Along the Caminada headland in Louisiana, the narrow barrier migrates landward at the same rate as the eroding headland (50 ft/yr). The instability of the sand prevents the establishment of vegetation. Grass covered sand dunes or coastal forests are absent from such systems.

High profile barriers are characterized by multiple dune ridges often more than 40 ft above mean sea level and are formed between deltas. Good examples of this category are Mustang and San Jose Islands along the central Texas coast. These islands received sediment from the Rio Grande Delta to the south and from the Brazos-Colorado Delta complex on their north side. Galveston Island, situated between the Brazos-Colorado Delta and the Trinity Delta, is another example. On high-profile barriers, the wildlife habitats are more varied than on low-profile ones. High-profile barriers along the northeastern gulf coast (Alabama and Mississippi) have developed the "classical" zonation of the maritime ecosystem, including dune, shrub, and maritime forest communities.

The underwater habitats also differ depending on barrier type. Lagoons, sounds, bays or marshes behind low-profile barriers are subject to rapid influx of large quantities of sand washed across the barrier from the seaward



HIGH-PROFILE BARRIER ISLAND



LOW-PROFILE BARRIER ISLAND

Figure 3. Comparative cross-sectional sketches of high- and low-profile barrier islands (from White et al. 1978).

Figure 4. Marsh outcrops on the beach at Sargent Beach, Texas, on the flanks of the Brazos-Colorado Deltaic headland. This is an extreme case of a low-profile barrier island (photo courtesy of R.A. Morton, December 1981).

side during major storms (Figure 5). In contrast, the high-profile barriers resist storm-induced overwash. Dunes are washed away by storm waves, but the island is not generally breached (Figure 6).

Overwash occurs when storm surge waters wash across the beach and through low areas in the dunes into backbarrier lowlands and marshes. These storm waters strip sand from the barrier beach and deposit it in the barrier's interior or soundside wetlands. Storm waters may also create temporary inlets in barriers. While these inlets are open, they can allow large quantities of sediment to be transported into the sounds behind barriers. After the inlets close, this sediment remains as fan-shaped shoals. Frequently these shoals are colonized by grasses and then become marshes. The end result of overwash and temporary inlet creation is a landward change in the position of the barrier. The entire sediment mass of the barrier system, however, remains much the same.

Until quite recently, scientists thought that sea-level changes had been negligible along the U.S. coast for the last 4,000 years, but it is now clear that this is not the case. In general, sea level has continued to rise, but there appear to have been oscillations about this rising average. Sea level may have gone up and down as much as 6-10 ft during periods of a few hundred years. On slopes of 1° or less, such changes result in shoreline migrations of hundreds or thousands of feet.

Over the last 100 years, fairly accurate sea-level records have been maintained in many harbors throughout the world. These records indicate that

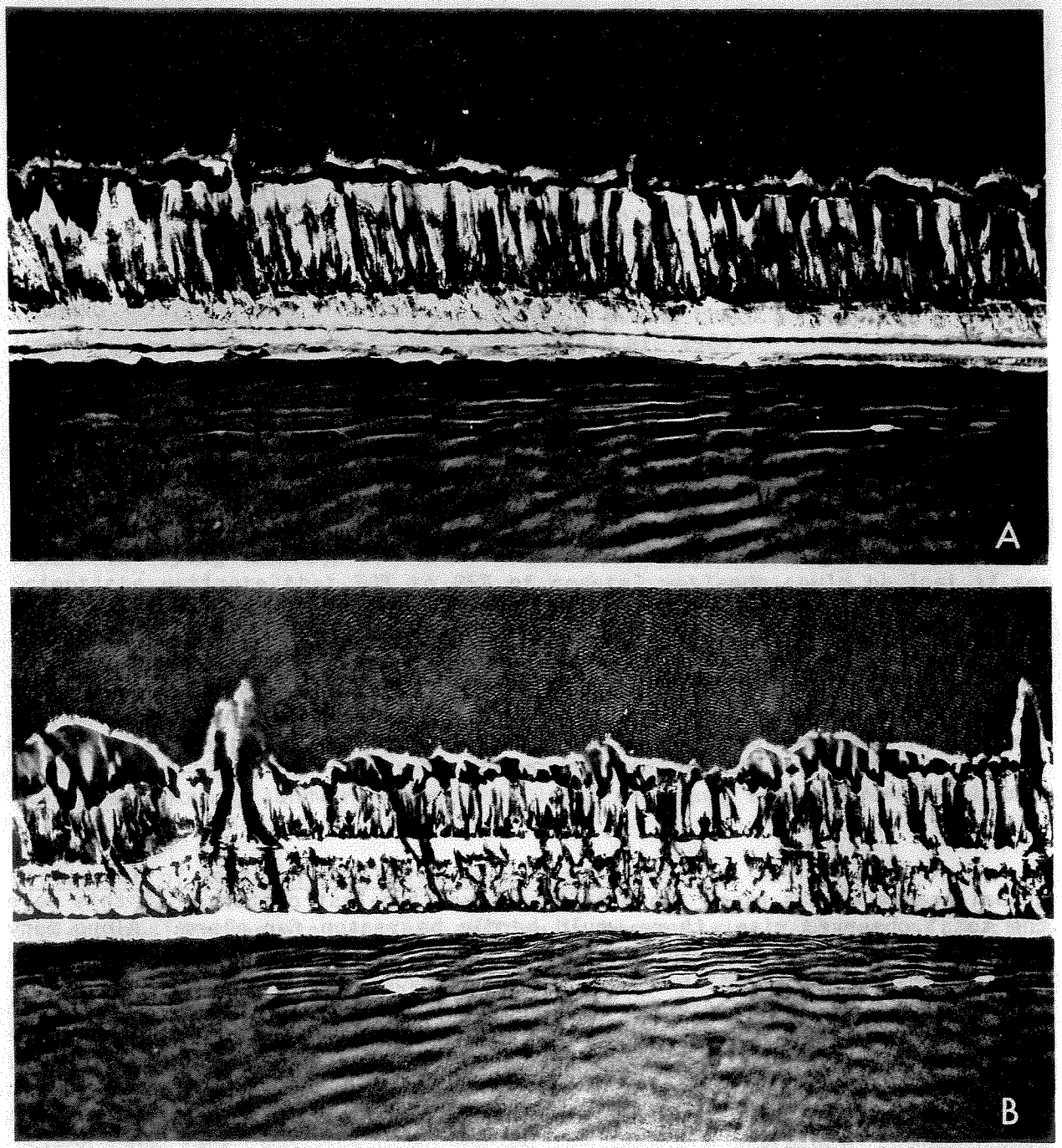


Figure 5. Vertical aerial photographs of Dauphin Island, Alabama, taken on September 22, 1979, only 9 days after the landfall of Hurricane Frederic. (A) Undeveloped western section of the island, CBRS Unit Q02. (B) Developed central part of the island. The pattern seen here is the typical storm response on low-profile barrier islands. Note the channels formed near many of the beach-front homes and the scourpools and sand deposits along the Mississippi Sound side of the island (top). Aerial photographs courtesy of the U.S. Army Corps of Engineers, Mobile District.

Figure 6. Undermining by Hurricane Allen of one of the units at the "Lost Colony" condominiums at Mustang Island, Texas. This illustrates that dune-scarp retreat is the typical storm response on a high-profile barrier island. Picture taken on August 15, 1980, 5 days after landfall of Allen. Mounds of sand on the right have been dumped there by truck after the storm. Contrast this with the storm-response of a low-profile barrier as seen in Figure 5.

global sea level has risen about 5 inches over the last century. If this were the total observed rise, there would hardly be reason for alarm. Along many parts of the U.S. coastline, however, the relative sea-level rise is much greater because the land is sinking. The average apparent rise in sea level, relative to most of the Atlantic and gulf coasts, was about 1 ft in the last century. Presently along the central gulf coast--where the weight of the Mississippi delta muds, withdrawal of ground water from shallow aquifers and extraction of oil and gas cause sinking of the land surface--the present annual rate of relative sea-level rise is now as high as 0.4 in/yr (Baumann 1980; Nummedal 1983a).

Concern over a possible acceleration in the rate of sea-level rise has been aroused by the increase in atmospheric concentrations of carbon dioxide, methane, chlorofluorocarbons, and several other "greenhouse gases." Because these gases allow sunlight to penetrate the atmosphere but retain outgoing infrared radiation (heat) in a manner somewhat analogous to the glass panels of a greenhouse, this phenomenon is commonly known as the "greenhouse effect." Without the greenhouse effect of the gases occurring naturally in the atmosphere, the earth would be 30 °C colder. The National Academy of Sciences

(NAS) has estimated that the expected doubling of carbon dioxide in the atmosphere could warm the earth an additional 3 °C in the next century, as could the combined impact of the other greenhouse gases. Such a global warming could raise sea level by several means. Because water expands when heated, warmer ocean temperatures could raise sea level 1-2 ft in the next century (Revelle 1983; Hoffman et al. 1983). The melting of alpine glaciers (Meier 1984) and the Greenland Ice Sheet (Polar Research Board 1985) could each raise world-wide sea level by up to 1 ft. Finally, the disintegration of the West Antarctic Ice Sheet could raise sea level an additional 3 ft by 2100 and perhaps by about 20 ft in the next 200-500 years (Bentley 1979; Hughes 1979). Considering all the factors, the Environmental Protection Agency (EPA) and NAS have estimated a possible rise in sea level along the U.S. coast of 3 to 5 ft in the next century (Revelle 1983; Hoffman et al. 1983).

The impact of sea-level rise on coastal erosion has been well documented. Bruun (1962) showed that a 1-ft rise in sea level will erode the typical sandy beach 100 to 500 ft. Rising sea level is widely thought to be the underlying cause of most coastal erosion (Bird 1976; Pilkey et al. 1981).

The physical effects of sea-level rise also include inundation of wetlands and other low-lying areas, barrier island overwash, and high storm surges. Scientists estimate that 50% to 85% of coastal wetlands could be lost if sea level rises as projected (Titus 1985; Kana et al. 1986).

Coastal barriers may respond to rising sea level and shorefront erosion in two fundamentally different ways. They may continuously move landward because of overwash and sand transport through inlets, or they may drown beneath the rising sea (Leatherman 1983). Although still a controversial subject, it appears that most barrier islands along the Atlantic coast of the United States are moving landward whereas at least some gulf coastal barriers appear to be drowning (Nummedal et al. 1984).

Discussion of Regional Physical Characteristics

The regionalization used in this section is based strictly on coastal physical and geological characteristics. The geographic boundaries of the regions are similar to those for coastal ecosystems in use by the U.S. Fish and Wildlife Service (Terrell 1979) and used in the next chapter of this report, but the regional boundaries do not exactly coincide. The regions used in this section are delineated in Figure 7.

1. Eastport to Cape Elizabeth; Maine. The U.S. east coast, north of Staten Island, New York, was glaciated during the last ice age and as a consequence has a character distinct from the remainder of the Atlantic coast. Nowhere has the glacial sculpture left a more direct imprint than along the coastline of Maine. Glacial scour of valleys has produced the present deeply embayed coastline; many embayments are scoured to the bedrock.

Most unconsolidated sedimentary material was moved far to the south during the glaciations, and modern rivers supply little sand to the coast. Sand is derived mainly from wave erosion of local cliffs and forms small pocket beaches and local baymouth spits. More commonly, the coast consists of cliffs

Figure 7. Map of the United States showing the coastal regions discussed in this chapter.

of igneous and metamorphic rock, sometimes bordered by extensive tidal mud flats. Fine-grained sediment (silt and clay) is abundant in this glaciated region, both on the offshore sea floor and in the river valleys. Strong flood-dominance of the tides in bays causes the mud to accumulate along the shore, and a large tidal range is responsible for extensive mudflat exposures at low tide.

Along this section of coast, the tidal range decreases from a mean of 13.6 ft in the east to 8.5 ft at Portland, Maine. The rapid eastward increase in tidal range is due to the influence of the entrance to the Bay of Fundy. The mean annual wave energy on the coastline is relatively low due to its southeastward orientation and its sheltered location on the north side of the Gulf of Maine. The mean annual wave height at Moose Peak is only 1.5 ft, and the regional mean annual onshore-directed wave power is among the lowest level anywhere along the U.S. coast. The same coastal orientation which shelters Maine from the common northeasterly winter storms, exposes it to Atlantic hurricanes. Hurricane landfall frequencies are higher in Maine than in northeast Florida (Figure 8).

2. Cape Elizabeth to Monomoy Point (Cape Cod); Maine, New Hampshire, and Massachusetts. This is a diverse region consisting of extensive coastal barrier beaches, spits, and islands. Barriers are numerous because of the availability of coarse-grained sediments from both glacial deposits and modern rivers.

The area around Kennebunk is typical of southern Maine. It consists of frequently alternating rocky headlands and sandy or gravelly beaches. Most of the beach sediment has been derived from wave erosion of headlands composed of glacial deposits. Farther south, along the coast of New Hampshire and Massachusetts north of Cape Ann, the extensive barrier island system owes its origin both to glacial deposits and to sand delivered to the coast by the Merrimack River. Plum Island is a typical tide-dominated barrier. The island is 8 mi long, 1 mi wide, and bordered by two deep tidal inlets with associated ebb- and flood-tidal deltas. With a tidal range of 8.3 ft and a mean annual wave height at the nearest recording station (Hampton Beach, New Hampshire) of only 1.4 ft, Plum Island falls within the tide-dominated category on Figure 1.

Massachusetts Bay provides a case study of the interplay between sediment sources, physical process variability, and resultant coastal shape. Exposed headlands at the north flank of the bay consist of erosion-resistant bedrock which produces only enough sediment for short pocket beaches and tombolos (sand or gravel bars that connect islands to the mainland or other islands). In Boston Harbor, in the center of the bay, elongated hills of glacial debris called drumlins provide an abundant source of sediment for the beaches at Nantasket and Winthrop. The sediment that wave erosion has scoured from the drumlins has been redistributed by longshore currents to form Nantasket Beach. Historical charts of Boston Harbor demonstrate that Nantasket Beach has grown in width and length since early colonial times.

Cape Cod is composed of ridges of rock debris and sand that the last glacial advance carried to its southern terminus. This ridge system extends eastward

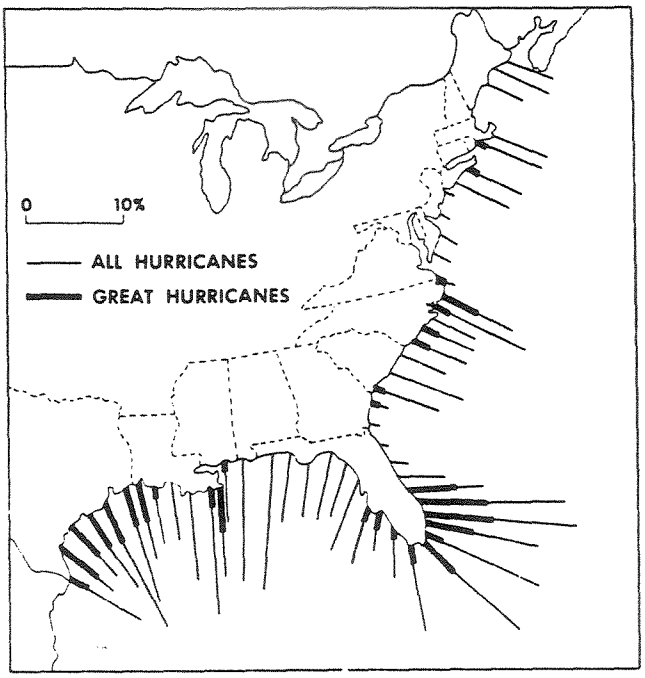


Figure 8. Annual hurricane landfall probabilities in the United States. Compiled from data in Simpson and Lawrence 1971 (figure from Nummedal 1983b).

to Long Island and westward to Georges Bank. The outer cape from Nauset north to Race Point near Provincetown consists mainly of sand and gravel washed off the glacier as it melted. Rapid shoreline retreat has been the norm for the middle section of the outer cape. According to Zeigler et al. (1964), the central cliffed coast has retreated at an average rate of 2.5 ft/yr. These cliffs, which are 120 to 180 ft high, have released large volumes of sediment to the longshore sediment transport system. The high waves associated with New England's famous storms, called "northeasters," transport large quantities of sand from the central part of the cape northward. Consequently, the northwestern shore of Cape Cod (Race Point) has grown rapidly.

Shoreline changes at Nauset Inlet, near the outer cape community of Nauset Highlands, have also been rapid, dramatic, and very complex (Shepard and Wanless 1971). The reasons for the complexity of change are the high wave energy (visually estimated mean wave height at the cape is 2.5 ft) and the location of Nauset Inlet at the divergence zone between northward and southward net longshore transport.

Nauset Spit and Monomoy Island, which form the southeast segment of Cape Cod, are subject to consistent southward sediment transport. They are both about 8 mi long, about 1 mi wide, and are separated by a tidal inlet at Chatham

Harbor. Both Chatham Harbor and Nauset Inlets have well-developed flood-tidal deltas and relatively small ebb-tidal deltas. Furthermore, the whole outer coast of Cape Cod is characterized by well-developed, often multiple, longshore bars in the surf zone. In accordance with the Davis and Hayes classification scheme, these barriers should be classified as mixed-energy. Increasing wave dominance towards the south is associated with a rapidly decreasing tidal range, from 7.6 ft at Cape Cod light to 3.7 ft at Monomoy Point.

3. Nantucket Island to the west end of Long Island Sound; Massachusetts, Rhode Island, Connecticut, and New York. Except for the Rhode Island shore west of Narragansett Bay, this section of coast is devoid of sizable barrier islands and spits, hence its categorization as a separate physical unit. The lack of extensive barriers along this coast is largely due to the low wave-energy, rather than lack of sediment supply. The southern shore of mainland Massachusetts is sheltered behind Nantucket Island, Martha's Vineyard, and their extensive associated shoals; the Connecticut shore is sheltered by Long Island. Only the Rhode Island coast is exposed to the Atlantic through Rhode Island Sound, and this is where most of the coastal barriers of the region are found.

The mainland shore consists of two large glacially scoured bays, Buzzards and Narragansett Bays, and two major estuaries, the Connecticut River and the nearby Thames. The adjacent coastline is characterized by glacial hills and outwash with pocket beaches and tombolos connecting small islands (e.g., Watch Hill Point, Rhode Island). A distinct longshore change in grain size is observed along Connecticut beaches, with coarse cobbles and boulders near glacial deposits grading into sand farther downdrift.

The relatively high wave-energy on the Rhode Island shore makes it distinctly different from neighboring coasts. The coastal barriers west of Narragansett Bay are long, thin, and of a wave-dominated form. Glacially scoured, erosion-resistant rock dominates the coast east of Narragansett Bay. An extremely irregular coast with a series of closely spaced estuaries was left after the glacier melted. These estuaries are typically sealed by baymouth barriers, many of which are breached by small tidal passes.

4. Montauk Point to Cape May-New York Bight; New York, and New Jersey. Within this stretch, the Atlantic coastline consists of an essentially continuous sequence of barrier islands and spits, with associated marshes and lagoons. The shorelines of the New York Bight form a natural unit as they constitute the nearly symmetrical flanks of a broad embayment with its apex at New York harbor. The tidal range is maximum at the apex.

Wave energies are high on the flanks of the New York Bight. The total mean annual wave power in the Atlantic City area is exceeded only by that off Cape Hatteras. Maximum onshore wave energy arrives from the northeast and east, exposing the upper New Jersey shore to the highest wave power. Numerous studies conducted by the U.S. Army Corps of Engineers provide a fairly clear picture of longshore sediment transport along the New Jersey shore. The highest transport rates are found in northern New Jersey, nearly 0.5 million yd^3/yr at Sandy Hook. Longshore transport is oriented northward from about

Point Pleasant to Sandy Hook; sand moves to the south between Point Pleasant and Cape May. There is a similar divergence in longshore transport on the south shore of Long Island. Sand moves eastward from Southampton to Montauk Point; it moves to the west from Southampton to the entrance of New York harbor (Coney Island).

The modern Long Island barriers are supplied by sediment eroded from the present bluffs on Long Island and from older (about 7,000 years B.P.) barriers that were present on what is today the Continental Shelf south of the modern barrier system. The coastal barriers along the Long Island south shore vary in length from 48 mi for Fire Island to only 12 mi for Rockaway Beach. This westward decrease in barrier length probably reflects the decreasing influence of waves, as compared to tides, in coastal sediment transport. The coastline can be classified as wave-dominated in eastern and central areas and as mixed-energy to the west of Fire Island Inlet. The barriers are extremely narrow, an average of 0.5 mi wide, and subject to overwash and inlet breaching, particularly towards the east. Moriches and Shinnecock Inlets have had histories of multiple openings and closings--some of which were aided by human intervention.

The northern 35 mi of the New Jersey shore consist of bay-mouth barriers, mainland beaches, and a northward building spit, Sandy Hook, which probably derives its sediment from erosion of preexisting barriers seaward of the Navesink and Shrewsbury Rivers (Shepard and Wanless 1971). Subsequent stabilization of the eroding shores at Sea Bright and Monmouth has cut off modern sediment supply to the spit, causing a series of problems of sand supply for the Sandy Hook National Recreation Area.

Continuous coastal barriers extend from Manasquan Inlet south to Cape May. From Manasquan to Beach Haven Inlet, the barriers are long and narrow (averaging 20 mi by 0.63 mi). From Beach Haven Inlet to Cape May, they are much shorter (average length 6.6 mi) and generally wider and drumstick-shaped. The reason for this sharp change is unclear. The wave energy is only slightly lower and the tidal range only moderately higher on the southern New Jersey coast than on the central segment where the long barriers are found. Nevertheless, the southern barriers have an unmistakable tide-dominated morphology: drumstick-shaped islands, closely spaced inlets, and large ebb-tidal deltas.

Within this shoreline segment, hurricane landfall frequencies are high on the southern shore of Long Island (6% annual probability per 50 mi of shore) but insignificant along the New Jersey shore (Figure 8).

5. Cape Henlopen to Cape Charles; Delaware, Maryland, and Virginia. The Delmarva Peninsula shows the following repetitive sequence of barrier shape and type from north to south: (1) a northern spit, formed by northward (or reverse) longshore sediment transport, (2) an eroding mainland beach section, (3) a southern segment of long spits or barrier islands, and (4) a downdrift terminal segment consisting of a chain of relatively short, stubby barriers. The other coastal compartments with a similar sequence of barrier landforms include Cape Cod, Long Island (sequence from northeast to southwest), New Jersey, and North Carolina's Outer Banks.

Cape Henlopen was built into the southern margin of Delaware Bay by longshore currents carrying sediment from the eroding Atlantic shore of Delaware around Bethany Beach northward. The cape consists of multiple high beach ridges and is well vegetated in the interior. Although the erosion rates along the Atlantic shore of the cape are relatively modest, the cape continues to retreat landward on its outer shore, growing into Delaware Bay on the northwest.

Segment 2 of the Delmarva compartment consists of an erosional headland from Bethany Beach north. Small bay-mouth barriers, with active and abandoned tidal inlets, have sealed the entrances to the Indian River, Rehoboth, and Isle of Wight Bays. These bay-mouth barriers are eroding, low in profile, and subject to extensive overwash during winter storms.

The third segment of this coastal compartment, essentially the Maryland sector, consists of one long barrier, Assateague Island, which extends south from Ocean City to Fishing Point, Virginia. Halsey (1979) argued that Assateague Island attained its present extensive length (35 mi) by linking earlier, shorter barriers with abundant sediments. Along the Maryland shore, strong longshore currents have carried sediment southward to the north jetty of Ocean City Inlet. Ocean City's beaches have widened while the beaches downdrift on Assateague Island have starved. The northern end of Assateague suffered severe erosion and overwash during the great Ash Wednesday storm of March 1962 and is very low in profile and subject to frequent washovers.

From Chincoteague Inlet to Cape Charles in Virginia, the coastal barriers are short (average 4.8 mi), narrow (average 1.25 mi) and commonly drumstick shaped. This configuration reflects the moderately strong tidal influence and the lack of sediment supply. Most sediment moving south along the Delmarva shore is presently trapped in the large accretionary spit complex at Fishing Point. Beach ridges on Chincoteague Island, landward of the southern tip of Assateague Island, diverge and curve towards the northeast, suggesting their formation by longshore currents coming from the southwest.

6. Cape Henry to Cape Lookout; Virginia and North Carolina. This is the southernmost of the similar coastal compartments of the Mid-Atlantic Bight. The northernmost segment of this compartment consists of a northward-building foreland, Cape Henry, built into the southern margin of Chesapeake Bay. The second segment of this compartment, the eroding mainland beach, is of limited lateral extent, including only about 10 mi of the Virginia Beach oceanfront. From this location, Currituck Spit extends 69 mi south and terminates to the south at Oregon Inlet, North Carolina. Hatteras Island extends the next 52 mi south to Hatteras Inlet. From Hatteras Inlet south, the North Carolina coastal barriers are shorter.

For its length, Currituck Spit is exceptionally narrow; the average width is only 0.63 mi, but in many places on the sound side, old flood-tidal deltas, which formed behind temporary island breaches, widen the spit. The spit is still washover-prone in many northern areas; however, high dunes have developed on the southern sections of the islands. In spite of its long-term history of breaches to the north, the average rate of shoreline retreat along Currituck Spit is currently only about 2 ft/yr.

The southern part of Currituck Spit and Hatteras Island is part of the Cape Hatteras National Seashore. An elaborate attempt to stabilize the Seashore included planting vegetation on an artificially enlarged dune ridge. While controversy still lingers over the success of this stabilization program, historical map studies suggest that the islands are now retreating both on the sound and the ocean side. Ultimately, the islands may drown in response to rising sea level, rather than continue their landward retreat.

Cape Hatteras is one of four Carolina Capes that are globally unique. The origin of these capes has been hotly debated for decades. They are, however, convergence zones of longshore sediment transport, and probably owe their location to the pattern of preexisting river valleys and drainage divides.

The convergence of longshore currents at the capes leads to strong offshore-directed currents visible on many high altitude photographs and satellite images. These currents have molded extensive sandy shoals off each of the capes. These extensive shoals, combined with frequent storms, have made the shelf off North Carolina's Outer Banks the "graveyard of the Atlantic."

The tidal range along the Outer Banks is low, only about 3.5 ft, and the wave energy is the highest observed along the east coast. The mean annual wave energy in the Cape Hatteras area is more than twice the energy level of the Boston area and nearly three times as high as the mean annual energy off south and southwest Florida.

7. Cape Lookout to Cape Romain; North Carolina and South Carolina. Cape Lookout divides the Outer Banks coast, which is characterized by exceptionally wide lagoons and long continuous barriers, from the coastline to the south, where the barrier islands are close to the mainland (southern North Carolina) or entirely absent (Myrtle Beach, South Carolina). Cape Lookout itself was formed by southward longshore sediment transport. Prior to human stabilization measures, the Cape had grown southward about 3 mi beyond the adjacent western island shoreline of Shackleford Banks. In contrast to the low, overwash-prone Core Banks to the north, the Cape itself is relatively high in profile.

Beaufort Inlet, 10 mi west of Cape Lookout, is fairly typical of the tidal inlets on the southern North Carolina coastline. The main channel in the inlet is relatively shallow and unstable. The sand associated with the inlet is divided about evenly into thirds: a flood-tidal delta in the lagoon, a set of shoals in the inlet itself, and a moderate ebb-tidal delta on the seaward side of the inlet. This sand distribution is characteristic of inlets where tidal transport and wave-induced sediment transport are of about equal importance. These mixed-energy inlets on the southern North Carolina coast cause notoriously unstable barrier island ends. The western 2 mi of Shackleford Banks have been especially susceptible to sudden breaches due to shifts in the inlet channel. Westward growth of this island end does not imply permanent creation of new land; rather, it represents the temporary attachment of some of the inlet sand bodies to the island. Floods, storms, or progressive channel migration will inevitably reshape this island end at some time in the future into subtidal sand flats or intertidal bars.

The major coastal barrier along this coastal segment, Bogue Banks, is 25 miles long, some 2 to 3 mi wide, and has much higher average elevation and individual dune ridges than is generally found on the Outer Banks. Barriers farther south, between New River and Cape Fear, are much shorter, are separated by numerous mixed-energy tidal inlets, and are of moderate height. Their average dimensions are 5.3 mi long and 2 mi wide. There are a total of 19 inlets along 110 miles of coast. The frequent opening and closing of inlets along this coast in historical times demonstrate their inherent instability.

Cape Fear, like Cape Lookout, is at a sediment convergence zone. It, too, has migrated southward over time, but the accretion has largely been in the form of a beach ridge set parallel to the south-facing shore. The trend of these ridges suggests that Frying Pan Shoals, off the cape, has been the primary source of sediment for this fairly recent growth. The implications of this interaction between the offshore shoal and the adjacent shoreline are extremely important. Offshore sands clearly are important sources for maintaining or accreting shorelines. These offshore sand bodies can be large shoals, like Frying Pan or Cape Lookout Shoals; linear sand ridges, like those along the New Jersey and Delmarva Peninsula; or ebb-tidal deltas, like those along the South Carolina and Georgia coast. In all cases, maintaining the sand body itself and avoiding interruption of the sand transport path between the offshore source and the shoreline are imperative to prevent accelerated shoreline erosion.

From Cape Fear to Cherry Grove Beach Inlet, 6 mi south of the North Carolina-South Carolina border, the barriers are similar to those north of Cape Fear. For 25 mi southward from Cherry Grove Beach, past Myrtle Beach, there are no barrier islands, lagoons, or coastal marshes: an unusual condition along the southeastern coast. Easy access to this mainland beach has led to the development of one of the largest beach-oriented tourist centers in the United States. The shoreline here, however, is continuously eroding, causing problems similar to those on barrier shorelines.

The wave energy along the Carolina shore decreases dramatically from north to south. Mean wave height at Nags Head, North Carolina, is 3.9 ft (highest along the east coast); at Holden Beach, North Carolina, 10 mi northeast of the South Carolina State line, the mean wave height is only 1.7 ft. The rapid decrease in wave height is a function of the south-facing shore to the west of the capes, the widening shelf, and the southward steady decline in Atlantic deep-water wave energies. Concurrent with this wave energy reduction is an increase in tidal range, from 3.7 ft at Point Lookout to 5.1 ft at Myrtle Beach.

This coastal region is highly vulnerable to tropical storms and hurricanes. The annual hurricane landfall probability within a 50-mi coastal segment surrounding Cape Lookout is 11%, the highest along the U.S. Atlantic coast north of Cape Canaveral. The significance of hurricanes in modifying these coastal landforms was demonstrated by Hurricane Hazel, which on October 15, 1954, opened three new inlets, disrupted the southward-building spit at Cape Fear, and developed many temporary washovers (Shepard and Wanless 1971).

8. Cape Romain to St. Johns River Entrance; South Carolina, Georgia, and Florida. This area has been called the Sea Islands section of the Atlantic coast. It is characterized by stubby barrier islands, commonly with a core of older sediment, and broad expanses of marsh and tidal creeks between the barriers and the mainland. Numerous coastal plain rivers supply fine-grained sediment to the estuarine systems. The few rivers draining the piedmont supply much of the sand to the nearshore system. The barriers have an average length of 6.9 mi and a width of 2.9 mi. Their lengths gradually increase towards the south. They generally show a high-profile beach ridge system.

Because of low wave energies, low hurricane landfall frequencies, and a rather high tidal range, the inlets along this coastal segment have large ebb-tidal deltas on their seaward side, and deep, stable main inlet channels. Sand from these ebb-tidal deltas is supplied to the next downdrift barrier island, producing the characteristic drumstick barrier shoreline configuration. The barriers are backed by extensive salt marshes. Water flow out of the salt marsh system is stronger than that into it, preventing sand in the littoral transport system from entering the back-barrier environment.

Beach erosion rates along the entire South Carolina coast are among the highest on the Atlantic coast. May et al. (1983) determined the average retreat rate to be 6.5 ft/yr, about three times as high as the average rate in North Carolina. Thus, although the topographically high South Carolina barriers are less likely to produce overwash than the Outer Banks, their shorelines retreat at a faster rate.

While the updrift end of each barrier goes through rapid shoreline fluctuations, the central barrier shoreline segment functions essentially as a zone of longshore sediment bypass, maintaining a fairly stable location. The southern, or downdrift end generally is a recurved spit and highly unstable. Such spits are prone to cut-offs caused by storms and floods, or by tidal creek migration. The history of periodic relocation of Captain Sam's Inlet, between Kiawah and Seabrook Islands, is an excellent example of this.

The nine Georgia Sea Islands are generally larger than the South Carolina barriers. The cores of the Sea Islands are composed of Pleistocene sediment deposited during previous high stands of sea level. Deep estuarine indentations, frequent, deep and stable tidal inlets, and large ebb-tidal deltas are characteristic of this tide-dominated shoreline. The tidal range at Daufuskie Landing, a few miles north of the Savannah River, is 7.2 ft, the highest along the coast south of Cape Cod. The tidal range is more than 5 ft along the entire coastal segment from Cape Romain to the mouth of the St. Johns River. The Sea Islands region has a moderately high risk of hurricane impact; the annual hurricane landfall probability in the 50-mi coastal segment that includes Savannah, Georgia, is 7%. An extreme hurricane in August 1893 had a storm tide greater than 17 ft and killed 1,000-2,000 people (Mathews et al. 1980).

9. St. Johns River Entrance to Key Biscayne; Florida. In sharp contrast to the Sea Islands coastal segment, the Florida east coast is characterized by long, continuous barriers, few inlets, and narrow shore-parallel lagoons.

These longer islands have formed in response to the relatively high wave-energy, the low tidal range, and the sparse river inflow. On the average, the barriers are 26 mi long and about 1 mi wide, suggesting wave dominance. The southward succession of barrier types is essentially the same as that seen in the compartments of the Mid-Atlantic Bight. From the St. Johns River entrance to a point 13 mi south, the coastline is an erosional mainland beach. Farther south a thin barrier separates the Atlantic Ocean from narrow shore-parallel lagoons. Partially cemented sand (beachrock) appears along the beach at numerous places and is deeply scoured by the Matanzas Inlet.

South of this eroding headland segment is a 78 mi long coastal barrier which extends from Ponce de Leon Inlet past Cape Canaveral to Sebastian Inlet. This is the longest coastal barrier along the east coast of the United States. The dredged entrance to Port Canaveral cuts the barrier, but is not a natural inlet. Farther south, the barriers become progressively more broken by tidal inlets.

North of Cape Canaveral the barriers consist of a mixture of quartz sand derived from the Carolinas and Georgia, and carbonate shell fragments eroded from the seafloor. A belt of low, vegetated dune ridges up to half a mile wide is commonly found. Abandoned, vegetated flood-tidal deltas are occasionally observed, attesting to episodic breaching and healing of these coastal barriers. Some storm-induced overwash deposits are present.

The Cape Canaveral region consists of a series of modern beach ridges (Cape Canaveral proper) in front of the much wider, preexisting, beach-ridge barrier and strand-plain complex of Merritt Island, which was also a cape like Canaveral but centered farther north. Both Cape Canaveral and False Cape have extensive offshore shoals, similar to those seaward of the Carolina Capes. Much of the sediment building Cape Canaveral and its shoal is probably derived from erosional retreat of shorelines to the north.

Historical map studies show an interesting spatial sequence of erosion and deposition. Erosion has prevailed north of False Cape. Recent erosion rates, according to May et al. (1983), have been about 3 ft/yr. False Cape itself and its offshore shoals appear to have grown; recent rates of accretion fall in the range of 0-3 ft. To the south, the northeast flank of Cape Canaveral is retreating at rates of about 3-10 ft/yr while the southeast flank is growing at rates of 3-10 ft/yr. This pattern of alternating zones of erosion and accretion is typical of the Florida east coast, even where capes as distinct as Cape Canaveral do not exist. If erosion and accretion zones are averaged, the overall retreat rate of the entire Florida east coast is quite moderate.

The coastal barrier chain along Florida's southeast coast consists of barriers typically 10 to 20 mi long, 0.5 to 1.5 mi wide, and covered with hotels and condominiums behind an exceedingly narrow, often nourished beach. Miami Beach is a typical example for the region. According to Army Corps of Engineers data, the Miami Beach shoreline retreated 500 ft between 1884 and 1944. Erosion continued in spite of the construction of an extensive groin system. By the early 1970's, Miami Beach had no beach at high tide and only a narrow swash-zone in front of the hotel seawalls at low tide. A major renourishment

project undertaken by the Army Corps of Engineers in the late 70's has now restored the beach. The sand was obtained by offshore dredging.

Two belts of limestone underlie the modern sediments of the southern tip of Florida. In the Miami area, both trend north-south. The inner belt is composed of cemented granular limestone and forms a platform some 10 ft above sea level. Miami sits on top of this belt. The second belt, farther seaward, is composed of coral reef limestone. This belt underlies Miami Beach and continues to the south. The depression between the first and second belts is today's Biscayne Bay.

Sand moving southward along the beaches of eastern Florida began encroaching on the northernmost tip of the second belt once sea level had risen high enough to submerge the ridge, probably some 3,000 years ago. The sandy barrier spit of Miami Beach continued growing south all the way to Cape Florida at the southern tip of Key Biscayne. Cape Florida is the southern terminus of a sandy coastal barrier system which extends continuously from Montauk Point on Long Island, New York, a distance of 1,420 mi. This is the longest continuous coastal barrier system in the world.

Southeast Florida is exposed to a moderate wave climate. The tidal range is also low because the narrow continental shelf provides no amplification of the deep-water Atlantic tide. In fact, the southward decrease in tidal range follows the progressive narrowing of the shelf. At St. Augustine Inlet, the mean tidal range is 4.5 ft, and at the entrance to Miami Harbor, it is only 2.5 ft. South Florida does, however, have the highest hurricane landfall frequencies in the United States (Figure 8). The area of Palm Beach has an annual landfall frequency per 50 mi of shore of 16%. Even great hurricanes (wind speeds above 125 mi/h) have an annual landfall probability of 7%.

10. The Keys and SW Florida, South of Cape Romano; Florida. The Florida Keys are built of the same two limestone belts discussed above for the Miami region. The long linear keys from Key Largo to Bahia Honda Key consist of reef limestone. The much more irregular, generally northwest-trending Keys from Big Pine Key to Key West consist of grandular limestone. The shape of the Keys partly reflects the original shape of the reef-tract and the limestone. Sand is very limited in the Keys and most of what is there is deposited in a series of small tidal-deltas which have formed on both sides of the tidal passes separating the individual Keys. Small pocket beaches exist between limestone headlands. All sand here is fragments of shell and limestone.

A discontinuous modern reef tract runs parallel to the Keys, about 2 to 5 mi offshore and patch reefs are located between the offshore reef and the Keys. Florida Bay, a large protected aquatic environment with carbonate mudflats and small mangrove islands, separates the Keys from the south Florida mainland. The mean annual offshore wave energy in this sector is the lowest along the United States coast.

Although the Florida Keys are not coastal barriers in the strictest definition of the term, they function as coastal barriers. They are subject to wind,

wave, and tidal energies, protect associated aquatic habitats, and are vulnerable to severe flooding and damage by hurricanes. The Keys provide habitats for unique local flora and fauna and together with the modern reef provide protection for the quiet-water environment of Florida Bay.

Cape Sable is the only barrier along the Everglades section of Florida's southwest coast. Cape Sable is actually three capes built by sand and gravel-sized shell fragments and extends for about 10 mi along the coast.

Hurricane landfall frequencies are very high in the Keys and the Everglades. The impact of major storms on the Keys is well documented. The most dramatic storm to hit the Keys was the 1935 hurricane, which hit while the railroad extension from Miami to Key West was under construction. This hurricane was one of the most violent in U.S. history, with a recorded barometric pressure as low as 26.35 inches (Shepard and Wanless 1971). The storm destroyed virtually all human-made structures, including the railroad, and killed some 400 people. The railroad was abandoned, but later the railroad route was reconstructed as a highway. The low topography of the Keys makes structures on them as vulnerable to destruction by hurricanes as those on the lowest profile, most washover-prone, sandy coastal barriers.

Geologically, however, the Keys respond differently to hurricanes than do sandy barriers, as documented in a study of the effects of Hurricane Donna in 1960 (Ball et al. 1967). The modern reefs are broken down to produce large amounts of rubble and sandy material which is moved across and between the Keys to accumulate in Florida Bay. Because of the hard limestone foundation, however, there is little physical change in island shape brought about by storms.

11. Cape Romano to Anclote Key; Florida. This coastal segment includes all of the barriers along the Florida west coast. In a pattern reminiscent of the coastal compartments of the Mid-Atlantic Bight, there are three successive barrier sequences, each consisting of eroding headlands, flanking spits, and adjacent barrier islands. In contrast to the mid-Atlantic coast, however, the compartments along Florida's west coast are more symmetrical. Rather than a short spit north of an eroding headland, as seen along the New Jersey and Delmarva shores, the Florida systems have spits and islands extending in a symmetrical fashion in both directions away from the headland.

In succession from south to north, the three barrier systems are (1) Cape Romano to Estero Island, with the central headland north of Naples; (2) Sanibel Island north to Anna Maria Key, with the central headland at Venice; and (3) Mullet Key at the entrance to Tampa Bay north to Anclote Key, with the central headland at Indian Rocks Beach in Pinellas County.

This symmetrical distribution of barriers on opposite flanks of a central headland is characteristic of the entire U.S. Gulf of Mexico coast. This difference between the gulf and Atlantic coasts is probably due to the difference in direction of dominant incoming waves. The Atlantic coast is dominated by waves from the northeast which causes prevailing southward longshore sediment transport along the Atlantic seaboard. Waves in the Gulf of

Mexico, on the other hand, are generally of local origin, and frequent reversals in longshore sediment transport are common.

Recent studies on these barrier islands document that the larger ones, including Sanibel Island, have sets of beach ridges ranging in age from 3,500 years to the present. Truncations of many older beach ridge sets by younger ones indicate that the growth has been far from uniform and continuous. Moreover, differences in the elevation of many ridge sets suggest that erosion, and subsequent beach ridge accretion, were responses to rapid fluctuations in sea level. As discussed earlier, sea level during the Holocene appears to have risen and fallen several times within periods of several hundred years. The southwest Florida coastal barriers responded with shoreline retreat of hundreds of yards followed by accretion, often in a different location. These kinds of changes are still occurring on southwest Florida's barriers. Shoreline stabilization in this region is a struggle against the basic principles of natural coastal evolution. Southwest Florida has the highest percentage of shoreline protection structures of any U.S. coastal segment south of northern New Jersey, yet many of the sugar-white sandy beaches of southwest Florida are gone.

Most of the southwest Florida barriers are short, narrow, and of low topographic profile. In spite of this low profile, they do not have many washovers due to the generally low wave energy. Hurricanes, however, have fragmented barriers. For example, Redfish Pass across Captiva Island was opened by a major hurricane in 1926. Tidal currents have subsequently maintained this pass, and have now built two symmetrical tidal deltas, one into Pine Island Sound, the other into the Gulf of Mexico.

The tidal range along the Florida west coast is quite low, 2.6 ft at Cape Romano and 2.1 ft at Anclote Key. Nevertheless, the large open-water lagoons, sounds, and estuaries account for large discharges of water and strong currents through most of these tidal passes. Consequently, some of the inlets are unusually deep; for example, Boca Grande Pass between Lacosta and Gasparilla Islands is more than 50 ft deep.

Hurricane landfall frequencies on the southwest coast of Florida are only half of what they are across the peninsula on the southeast coast. The reason, of course, is that most hurricanes approach the United States from the southeast.

12. Anclote Key to Ochlockonee River; Florida. The northwest coast of peninsular Florida is dramatically different from any other Atlantic or gulf shoreline because it is essentially devoid of modern unconsolidated sediment. Except for the Suwannee oyster reef, which is a largely intertidal deposit west of the mouth of the Suwannee River, there are no coastal barriers.

Cedar Key and Pepperfish Keys, however, are nearshore limestone islands which offer significant storm protection for the adjacent mainland. Also, a series of small oyster shell berms in the shallow nearshore waters are effective barriers, attenuating incoming waves. The mainland fringe, which consists of low-lying marshy plains cut by thousands of little streams and springs, is exposed to calm seas most of the year. Although there are no long-term wave records from this area, observations suggest that this coast is exposed to

very low wave energy. Because of the low wave energy, the tidal currents become major agents of sediment transport even though the tidal range is only about 2.5 ft.

Although this coast is less susceptible to shoreline retreat than the sandy southern shore, it is extremely vulnerable to hurricanes because of the low-lying, easily flooded, coastal plains. Hurricane landfall probabilities are equal to, or greater than, those along the southwest Florida coastline.

13. Ochlockonee River to Cat Island; Florida, Alabama, and Mississippi. The shoreline changes dramatically at the Ochlockonee River, the easternmost of the Florida rivers which drain the sandy and muddy deposits of the adjacent Coastal Plain. The large Ochlockonee Bay estuary, like Mobile, Galveston, and Corpus Christi Bays and many other gulf coast estuaries, is a drowned river valley. Also characteristic of most northern gulf coast barriers, the sand here is largely eroded from preexisting headlands and then carried longshore (sometimes in both directions) to form a succession of barrier spits and barrier islands.

The Florida Panhandle is characterized by offshore barrier islands around the Apalachicola Delta, a series of mainland beaches and spits between Cape San Blas and Destin, followed by long coastal barriers west towards the Alabama State line. The Alabama coast has a major spit extending from Perdido Bay on the Florida state line to Fort Morgan at the entrance to Mobile Bay. West of Mobile Bay is Dauphin Island, which extends to the Mississippi State line. The Mississippi mainland coast is fronted in its entirety by a series of offshore coastal barriers. From east to west these are Petit Bois, Horn, East and West Ship, and Cat Islands.

Five barrier islands and spits with an average length of 13 mi and a width of 0.75 mi front the Apalachicola Delta. The presence of these barriers indicates that the Apalachicola is no longer an active delta; the barriers have resulted from the redistribution of sand from deltaic deposits. The modern Apalachicola River has a small delta at the head of Apalachicola Bay. No significant amount of sand is carried from this delta to the modern sandy barriers of St. George or St. Vincent Island. Because there is no significant sediment supplied to these islands from the river, they will erode unless the shoreline retreats elsewhere, releasing sand for their nourishment.

Cape San Blas, on the west flank of this old deltaic headland, is associated with offshore shoals extending 15 mi to the south of the cape. A smaller system of shoals also exists off Cape St. George. These shoals, like their counterparts off the Carolina capes or Cape Canaveral, play a significant, yet incompletely understood, role in the development and stability of the Apalachicola Delta barriers. Basic questions about sediment dynamics in this region are still unresolved; assessments of shoreline stability and long-term changes in island configuration are hazardous guesses at best.

Dauphin Island, Alabama, consists of an older, eastern core against the entrance into Mobile Bay, and a younger, long, low-profile western spit, built by sediment moving westward in longshore transport from the older core. On the eastern core, the island is fronted by dunes up to 30 ft high along most of

its seaward shore. The ground elevation within much of the core is well over 10 ft. The historical settlement on Dauphin Island was located on the bay side of this core. This is believed to be the most stable part of the island. The western spit of Dauphin Island was breached and separated from its eastern core by a hurricane in 1916. The breach was initially more than 5 mi wide and began at the western end of the older core. By the early 1940's, the breach had healed. In 1947 a smaller hurricane breached the island again, within the same area, but this time the break healed very quickly.

When Dauphin Island was connected to the mainland of Alabama by a causeway in 1955, the scars of the former breaches were evident only to trained observers, and development of vacation homes on the western spit began. Hurricane Frederick, which made landfall on the Alabama coast in 1979, heavily damaged the developed segment on the western low-profile spit and blew down the causeway. Some $35 million of National Flood Insurance funds were spent to assist in rebuilding the vacation homes and equivalent public funds were spent to rebuild the causeway.

Most of Mississippi's coastal barriers are part of the Gulf Islands National Seashore. Much of those barriers that are not part of the Seashore were incorporated in the CBRS in 1982. These islands are all relatively young. They are well vegetated by southern maritime climax forests of pine and palmetto. The islands generally have high beach ridges, yet may be overwashed by strong storms. Hurricane Camille, which struck the Mississippi coast in 1969, cut Ship Island into two segments. The breach has not yet shown signs of healing. The same hurricane produced extensive washover fans on Horn Island.

All the barriers are moving towards the west at a rapid rate through erosion of their eastern ends and accretion on the west. In this way, Horn Island has migrated over 1.5 mi westward during the last century. In a natural system, such migration would cause no problems, but dredged channel entrances into various gulf coast harbors are threatened by continued migration. A minimum number of buildings exist on the Mississippi coastal barriers, which have the widest and best maintained beaches along the entire gulf coast.

14. The Mississippi Delta coast; Louisiana. The Mississippi River deltaic plain extends from the Louisiana-Mississippi State line in the east to Marsh Island and Vermilion Bay in the west. About three-fourths of the Louisiana coastline flanks the Mississippi Delta. The term Mississippi River Delta as used in this report refers to the entire portion of coastal Louisiana that has been built by the Mississippi River over the last 6,000 years. At present, only the tip of the Mississippi Delta in lower Plaquemines Parish ("parish" is the Louisiana equivalent of "county") and the Atchafalaya Delta at the head of Atchafalaya Bay are actively building land. Other, older "lobes" of the delta complex are being eroded and inundated by rising sea level.

The cycle of Mississippi Delta lobe evolution is as follows: (1) a delta lobe forms in one location and large quantities of sand are deposited near the river mouth; (2) the delta grows seaward and the river channel gets longer; (3) the river changes course to a new and shorter route to the sea; (4) waves and longshore currents redistribute the abandoned river mouth sand deposits,

building barrier spits and bars; (5) the abandoned delta front rapidly sinks into earlier delta deposits and the sea gradually separates the barrier chain from the adjacent mainland deltaic plain; and (6) the barrier drowns, forming an inner shelf shoal. This evolutionary cycle for Louisiana's barrier islands is probably not that different from the evolution of some other barrier systems along the U.S. coastline, but because of the more rapid sinking of the deltaic plain in Louisiana, the barriers change faster than barriers in most other coastal states.

Bayou Lafourche was the main channel of the Mississippi River until some 500-700 years ago. At its maximum size the Lafourche Delta extended a few miles seaward of the present shoreline at Fourchon and Grand Isle. Sand from the Lafourche Delta (headland) was transported laterally to build the eastern Caminada spit and Grand Isle, and the western islands of East Timbalier and Timbalier. This pattern is very similar to that observed in southwest Florida: a central headland erodes into symmetrically distributed spits and barrier islands. In Louisiana, the headland sand source is a delta, whereas in Florida it is not, but this makes little difference to the resulting barrier pattern. As the Lafourche Delta began to sink, the barrier beaches began to retreat.

Louisiana has the most rapidly retreating beaches in the Nation. The average retreat rate for the Fourchon beach over the last 100 years has been in excess of 60 ft/yr. The statewide average according to May et al. (1983) is in excess of 12 ft/yr. The consequences of barrier island retreat are observed at Isles Dernieres in Terrebonne Parish and at the Chandeleur Islands in St. Bernard Parish. These barrier islands once flanked central headlands like the central headland at Fourchon, but both have subsequently become separated from the mainland. The St. Bernard Delta lobe, the older of the two, is about 3,500 years old, and the associated Chandeleur Islands are farther from the mainland than any other barrier island system in the Nation. Delta lobes older than the St. Bernard no longer have associated barrier islands. There are reasons to believe, however, that some of the sandy shoals on the Louisiana Continental Shelf are older, now drowned, barrier islands.

Most of Louisiana's barrier islands are not developable as vacation resorts because of their inaccessibility and extremely high rates of migration. Thorough documentation of their patterns of change, however, is already proving to be of help in developing predictive models for barrier island evolution elsewhere. The high rates of change observed in Louisiana may have nationwide applicability if the anticipated acceleration in global sea-level rise becomes a reality.

15. Vermilion Bay to the Sabine River; Louisiana. The Chenier Plain of the Louisiana coast between Vermilion Bay and the Sabine River is geologically unique along the U.S. coastline. It owes its origin to the vast quantities of fine-grained (muddy) sediments issued by the Mississippi River and to the moderate wave climate of the north-central Gulf of Mexico.

The Chenier Plain is separated from the deltaic plain to the east by Southwest Pass, which is 150 ft deep. Deep tidal passes are not uncommon along the

Louisiana coast. Although the tidal range is small (only 1.6 ft at Southwest Pass), the tidal discharge through this pass is very large, both because of the size of Vermilion Bay and because of the pattern of wind-driven circulation in the bay, which causes frequent transport of Atchafalaya Bay water into Vermilion Bay and out through Southwest Pass. The depth of the pass is, however, probably more a reflection of storm events than the daily volume of tidal waters exchanged.

Mud from the Mississippi River outlets has always been transported to the west by the prevailing westward-flowing coastal currents off Louisiana. For the last 3,000 years the Chenier Plain has been a site of rapid coastal accretion in response to this mud supply. The growth, however, has not been uniform. Periods of rapid accretion of mudflats have alternated with periods of coastal retreat. During phases of retreat, the coarser sediment, primarily shell-hash, has been concentrated and deposited as linear ridges or "cheniers." These ridges attain local elevations above 10 ft and constitute the only high and relatively dry ground in Cameron and Vermilion Parishes. The land between the ridges is at or only a few feet above sea level and permanently wet.

The Chenier Plain is fronted by mudflats instead of the usual sandy beaches. Fluid mud, with the consistency of yogurt, extends from the seaward edge of the marsh grasses to a few hundred yards offshore. The mud is an extremely effective wave absorber; the mainland shore is rarely exposed to any wave action except during storms.

Technically, the Chenier ridges do constitute barriers protecting the wetlands on their landward side. The danger of inhabiting the Chenier ridges is fully comparable to that of living on barrier islands, as was demonstrated when Hurricane Audrey flooded most of Cameron Parish in 1957 and killed an estimated 500 people.

16. Sabine River to the Rio Grande; Texas. The Texas coast is a continuous barrier shoreline. The barrier spits and islands were formed from sediments supplied from three deltaic headlands: the Trinity Delta in Jefferson County immediately west of the Sabine River; the Brazos-Colorado Rivers Delta complex in Brazoria and Matagorda Counties; and the Rio Grande Delta in southernmost Cameron County.

The Texas barriers are arranged symmetrically around these erosional deltaic headlands. Because the shoreline has been straightened by this process, the longshore currents once flowing northward have now reversed, and net sediment transport along the entire upper Texas coast today is towards the southwest.

Climate is another important variable that greatly affects Texas coastal barriers. Texas is the only Atlantic or gulf coastal state with a significant climatic range; the coastal zone is humid subtropical in the east and semiarid in the south. South of Corpus Christi the annual evaporation exceeds the precipitation and the landscape has an arid appearance outside the irrigated valleys. On high-profile, southern barriers, vegetation is sparse, and continuous winds have built high dunes.

COASTAL BARRIERS ALONG PUERTO RICO AND THE U.S. VIRGIN ISLANDS

Physical Characteristics of the Islands

Puerto Rico is the easternmost island of the Greater Antilles. The U.S. Virgin Islands (U.S.V.I.), consisting of St. Croix, St. Thomas, St. John, and about 90 smaller islands, lie 40-65 mi east and southeast of Puerto Rico.

Puerto Rico, St. Thomas, and St. John are on the Puerto Rican plateau, which is delineated by the 100-fathom depth contour. St. Croix is 35 mi to the south on a separate submerged ridge. Puerto Rico formed on the emerged crest of an elongated ridge that trends through Hispaniola, Puerto Rico, and the Virgin Islands. To the north is the Puerto Rican trench with depths to 27,500 ft. To the south, the Virgin Islands basin is 13,500 ft deep. A flat terrace about 60 ft deep, probably a result of wave erosion during the Pleistocene when sea level was lower, surrounds St. Thomas and St. John. As a transition zone between oceanic and continental plates, the Caribbean island arc is an active earthquake zone. Puerto Rico and the U.S.V.I. do not experience as much volcanic activity as some of the other islands, such as Guadeloupe and Martinique; however, tsunamis have occurred in the area.

Hurricanes have developed in every month of the year in the Eastern Carribbean, but most storms pass through between August and October with peak activity in September. Twenty-four hurricanes have passed within 50 mi of the Virgin Islands since 1900. Major hurricanes occur about once every 33 years.

The mean tidal range in the islands is only 0.8-1.0 ft and tidal currents are usually weak. Diurnal tides predominate around St. Croix and on the south coasts of St. John and St. Thomas. Semidiurnal tides occur on the north coasts of Puerto Rico, St. Thomas, and St. John because of exposure to open ocean water. Waves come primarily from the east in the winter and the southeast in the summer, in response to seasonal shifts in wind direction. Waves are 1-3 ft about half of the time. Southeasterly swells are common in late summer and autumn, while northern swells, occasionally reaching 10-12 ft nearshore, develop in winter. The northern swells create strong longshore currents. Wave energy is concentrated on projecting headlands, and shoreline configuration reflects variations in the resistance of specific rock types in these headlands to erosion.

Sediment transport involves a complex interaction of biological, physical, and gravitational factors. During storms, rates of sediment transport are an order of magnitude higher than during normal conditions. Distinct channels through coral reefs facilitate seaward sediment transport. Sources of sand include skeletons of marine algae and invertebrates, bedrock headlands, and existing accumulations of sand.

St. Croix's northern shelf has no major storage sites for sediment; therefore, sediment is transported into the deep basin offshore. Off the south coast of the island are two large sand bodies, one along the southwest coast and the other extending from Grapetree Bay to Grass Point. Substantial amounts of sediment move off the shelf near the southwest tip of the island at Sandy Point. An extensive reef parallels most of the south shore. Three areas off

St. Thomas have significant sand deposits: two are west of Saba Island and the other is west of Buck Island. There are also submerged sand deposits on the insular shelf of Puerto Rico.

Organisms play a significant role in the production, break-down, and transport of carbonate sediments. The distribution of organisms can therefore affect the distribution of sediments. Biological processes such as the reduction of water circulation in seagrass beds or the reworking of sediments and rebuilding of mounds by shrimp and crabs are more important in protected bays than in open water where physical processes, particularly currents, dominate.

Beaches in Puerto Rico and the Virgin Islands have constantly changing profiles, varying with location and with the season. The steep slopes and narrow berms of exposed beaches indicate high-energy waves. In the summer months when the wave climate is mild, berms tend to become wider. During the winter, high-energy waves tend to transport sand offshore. Many beaches inside deep bays show little change. Reefs and seagrass beds buffer wave energies and promote beach stability.

Unique Features of Coastal Barriers in the Caribbean

The coastal barriers in Puerto Rico and the Virgin Islands often differ from the curvilinear, sandy barriers found on most of the Atlantic Ocean and Gulf of Mexico coasts of the continental United States. Along the northern coast of Puerto Rico, a carbonate-cemented dune line is located immediately seaward of a more typical coastal barrier consisting of beach, dunes, and mangroves. In other areas, deposits of beach rock--carbonate-cemented gravel--is interbedded with the unconsolidated sediments on the barrier. Fringing mangroves occur in many areas. The mangroves stabilize nearshore deposits of silt and clay in low wave-energy environments. Many of these fringing mangroves occur behind coral reefs. Fringing mangroves and associated coral reef systems are considered coastal barriers in tropical and semitropical areas because the protection they provide for the associated aquatic habitats and the mainland is comparable to that provided by linear or curvilinear sandy coastal barriers elsewhere.

COASTAL BARRIERS ALONG OTHER COASTLINES OF THE UNITED STATES

Although coastal barriers are best developed along the Atlantic and Gulf of Mexico coastlines, they exist on all coastlines of the United States. At the request of the Secretary of the Interior in 1983, the Coastal Barriers Study Group undertook a study of the coastal barriers of these other coastlines. The physical characteristics of the coastal barriers of the Great Lakes, Hawaii and American Samoa, and the Pacific coast are generally described in Appendixes B, C, and D to this report.

CHAPTER 3

AN ECOLOGICAL EXAMINATION OF COASTAL BARRIERS

Section 2 of the CBRA emphasizes the importance of coastal barriers as habitat for a variety of fish and wildlife. This chapter explores the ecological relationship between living organisms and their coastal barrier habitat. In any given area, different types of plants, fish, wildlife, and other biota make up a living community that functions together with the nonliving environment as an ecosystem. Thus the ecosystem consists of an interdependent network of physical and biological components. No single component can be altered without affecting others since no component functions independently. Recognition of this concept is essential if management efforts are to maximize natural resource values and avoid emphasizing one component at the expense of another.

COASTAL BARRIERS ALONG THE ATLANTIC OCEAN AND GULF OF MEXICO COASTS

The Ecosystems

For the purposes of this report, Atlantic and Gulf of Mexico coastal barriers can, very generally, be divided into five interrelated ecosystems: (1) coastal marine, (2) maritime, (3) estuarine, (4) freshwater (riverine, palustrine, lacustrine), and (5) uplands on the mainland (Figure 9). Each ecosystem is characterized by a unique combination of geological, botanical and biological features, knitted together by the common physical influence of coastal processes. Physical forces shaping these ecosystems include wind, waves, tide, currents, precipitation, river flow, and temperature. Good examples of each ecosystem can be found throughout the CBRS, but only occasionally are all represented in a single CBRS unit.

Coastal marine ecosystem. For the purposes of this report, the coastal marine ecosystem can be described as beginning just seaward of the beach dunes and continuing seaward about 3 miles offshore. The substrate is typically sandy, although some rocky shores are also included in the CBRS. Physical factors, including winds, waves, tides, and currents, are primarily responsible for shaping this system. Coastal marine waters are typically rich in the nutrients needed for biological production. These nutrients are supplied both by river and estuarine discharge and by coastal upwelling of deep ocean waters. Most of the primary production in coastal marine ecosystems is accomplished by microscopic plants called phytoplankton.

The coastal marine habitat can be a harsh environment, but many animals have adapted to living there. Coastal waters are used by some fish species for

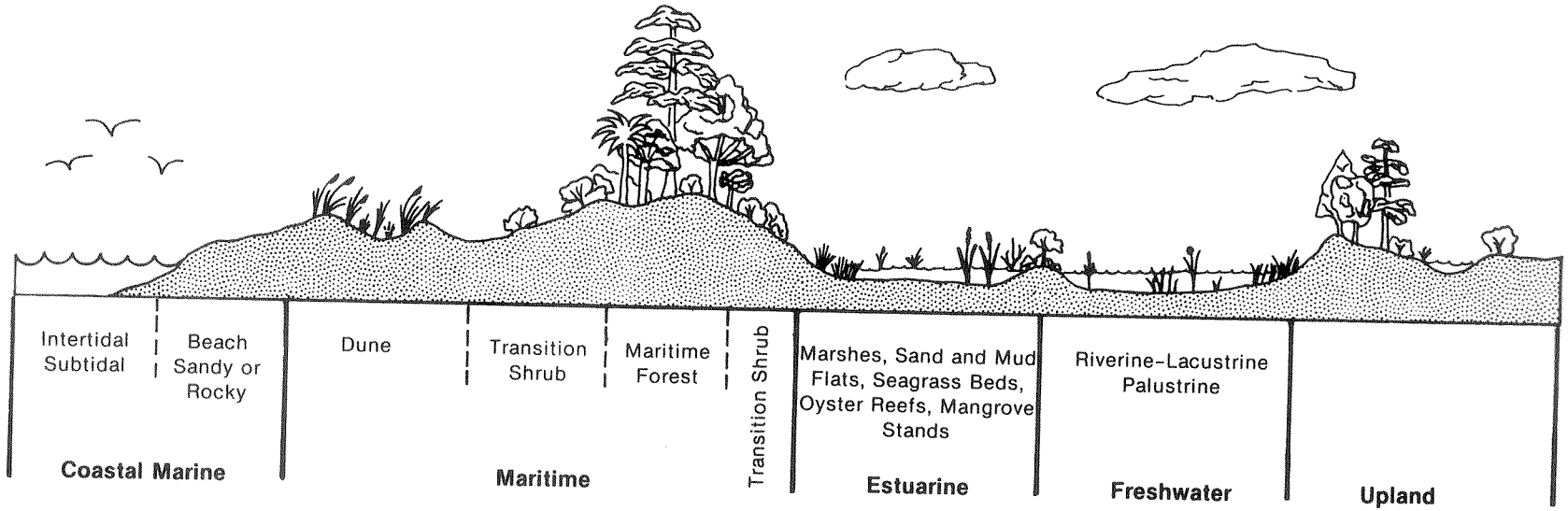


Figure 9. Generalized cross-section of coastal barrier ecosystems.

their entire life cycle. These species must adapt to the rigors of wide fluctuations in turbidity, current velocity, and bottom movement. Many other fish species found in coastal waters are transients, spawning offshore, migrating to estuaries as juveniles, and returning to oceanic waters as subadults or adults. Like some shrimp species, such fish link the marine and estuarine environments.

Marine turtles use the coastal marine ecosystem for mating and feeding. They are of particular concern because of recent decreases in their populations. Turtle nesting on coastal beaches occurs from North Carolina to Texas, although several species may be seen offshore as far north as New England. Mature females mate in coastal waters and then move on to sandy beaches to nest. Later, hatchling turtles emerge from the beach nesting sites and crawl back to the sea, apparently leaving the coastal waters. The turtles typically reappear in the coastal waters as juveniles and feed there during the warmer months.

The abundant marine life found in nearshore coastal waters provides an important food source for numerous species of birds. In New England and the Middle Atlantic States, bird species numbers vary seasonally, while in the southeast and Gulf Coast States, large numbers of year-round residents and seasonal migrants are found.

The birds in this ecosystem feed on a variety of marine organisms. Some birds feed on the abundant microscopic animals called zooplankton that are found in nearshore waters. Diving ducks consume animals living on the bottom such as mollusks, crustaceans, and worms. Many birds that use the coastal marine waters are fish-eaters. Fish are taken by aerially diving birds (terns, pelicans, ospreys), swimming birds (cormorants, some diving ducks), and surface feeders (skimmers, some gulls). Numerous shorebirds feed on small crustaceans, clams, and worms living in the beach sands. The peregrine falcon feeds almost exclusively on small birds found on intertidal beaches.

Only a small group of mammals rely either directly or indirectly on coastal barrier marine ecosystems. Small cetaceans such as porpoises and blackfish are the most prominent marine mammals living around coastal barriers. They are found in coastal and estuarine waters and are most likely attracted by the large schools of fish which inhabit these areas. Foraging raccoons, rodents, and even deer occasionally come to the beaches to feed at night.

Maritime ecosystem. The maritime ecosystem is generally defined as all upland areas on coastal barriers, including those areas not classified as wetlands or aquatic systems by the U.S. Fish and Wildlife Service (FWS). This ecosystem is bounded on the oceanside by the spring high-tide mark and on the landward side by tidal marshes, creeks, or rivers. It can include a dune community behind the ocean beaches, a transitional shrub zone, and a maritime forest (figure 9).

A distinct zonation of plants often characterizes the maritime ecosystem. Salt spray, produced by wind and wave interaction, is the major controlling factor in this distribution. The more salt-tolerant plant species tend to be located closer to the ocean, while less tolerant plants are located towards

the interior of the barrier. Each plant zone harbors wildlife adapted to exploiting its habitat.

The primary producers in this system are the dune grasses, the shrubs, and the forest trees. Much of this primary production is not directly consumed by the insects, amphibians, birds, and mammals found here, but enters a decomposer's food chain on the forest floor or is exported by wind and water to surrounding ecosystems. The decomposed plant material, or detritus, is then eaten by a variety of organisms.

The following sections discuss the three major communities in the maritime ecosystem.

A. Dune community. Coastal dunes are formed by wind-blown sand. Salt-tolerant dune grasses help stabilize accumulating sediments, promoting dune growth. The maritime dune field is a harsh environment for animals. They must contend with salt spray, limited vegetation, wind, shifting sand, drought, occasional flooding, and high temperatures. Because of this, relatively few animals are permanent dune residents. Most are transients that are also found in other terrestrial habitats.

A limited number of snakes and lizards can be found in dune areas, and even some frogs and toads under certain conditions. Because birds are more mobile than other animals, they are free to exploit this habitat when conditions are most suitable. Some species forage here, some nest here, and others are seasonally permanent residents if ground cover is available. The relatively seed-rich environment of the dune area attracts numerous seed-eating songbirds, some of which nest in the grasses and shrubs. Insect-eaters, such as warblers and swallows, are visitors as are some raptors such as sparrow hawks and great-horned owls. Shorebirds, gulls, and terns occasionally nest in great numbers in the dune habitat and feed in adjacent coastal marine areas.

Barriers are essential migratory habitat for the hundreds of thousands of birds that move along the Atlantic and gulf coast flyways semiannually. These migrants rely on beaches and dunes for feeding and resting sites. In addition, many marine birds use coastal barriers for breeding, either on the coastal beaches (gulls and terns), in the maritime forest (ospreys), or in the wetlands (pelicans, many ducks).

Under favorable conditions, a few mammals permanently reside in the dune areas. These include beach mice, rats, and moles. As in the coastal beach area, however, most other mammals found here, such as rabbits, raccoons, and deer, are nocturnal foragers, and some may simply be traversing the area from forest to beach in their nightly search for food.

B. Transitional shrub zone. This zone is a distinct, dense, but generally narrow band between the maritime forest and dune community on the oceanside, and between the maritime forest and landward marsh, creek, or estuary on the landward side of a barrier island where both forest and shrub zones exist (Figure 9). The zone is characterized by a low diversity of plant species, extremely dense structure with little or no understory, and a total height between 10 and 13 ft. The location of the shrub zone depends to a

large degree on the intensity of salt spray, which is a function of the angle of the beach with respect to the prevailing winds and the height of the fore and back dunes. Shrub communities are also found in interdune depressions.

The shrub zone along the seaward margin is noted for its characteristic sheared or "espaliered" canopy. It was originally thought that the shape of the canopy was due to wind intensity, as is the case in mountain systems, but it is now thought that salt spray is the primary cause of this feature.

Shrub habitats offer greater protection from the harsh physical environment, so greater numbers of amphibians and reptiles are found there than in the adjacent dunes. The low plant height and lack of understory mean bird numbers are low. The species which do inhabit this community are principally insect- and seed-eating passerines (songbirds) with occasional predators such as sparrow or sharp-shinned hawks. A number of passerines use this habitat for nesting while foraging elsewhere. As in the dune and coastal beach areas, most mammals occurring in the shrub zone are not considered permanent residents.

C. Maritime forest. The precise limits of the maritime forest are difficult to define. Like the shrub zone, its distribution is influenced by the effects of salt spray from the oceanside of the barrier island. Both the number of species of trees and the structural diversity of the forest increase as the distance from ocean sprays becomes greater. The fullest forest is found where all signs of salt spray disappear. Because this may not occur until one has left the barrier and moved inland, maritime forests are a relatively uncommon feature within the CBRS.

The maritime forest is the favored habitat for most of the nonmarine reptiles and amphibians found on coastal barriers because the most protected and stable freshwater habitats occur here, food is abundant, and physiological stress is reduced. Lizards, snakes, frogs, toads, salamanders, and turtles are all common inhabitants. The maritime forest also supports most of the nonmarine birds found on barriers. The forest understory provides a variety of habitats. Although the dominant species are insect-eaters, such as warblers, flycatchers, and swallows, numerous other bird groups are found here as well. The maritime forest of southeastern coastal barriers is the native habitat of the painted bunting, one of the most colorful North American birds.

Mammals are generally less common here than in mainland forest habitats. A number of species are considered permanent residents, but none are exclusive to coastal barriers. Most can be found foraging in barrier habitats other than maritime forests. Herbivores are represented by mice, squirrels, rabbits, and deer, while predators range from the diminutive moles, shrews, and bats, to the larger minks, otters, and even bobcats. Variety and number are largely determined by the size of the barrier, the nearness of the barrier to the mainland, and the availability of suitable habitat.

Estuarine ecosystem. The estuarine ecosystem has been defined by the FWS as deepwater tidal habitats and adjacent wetlands semienclosed by land but having open, partially obstructed, or sporadic access to the open ocean (Cowardin et

al. 1979). Estuarine waters must also be diluted, at least occasionally, by freshwater runoff from the land. Boundaries between estuarine and adjacent marine and freshwater ecosystems are roughly determined by water salinity, distribution of certain aquatic plants, and local geography. The estuarine system includes many different habitats such as mud and sand flats, seagrass beds, oyster reefs, mangrove stands, and tidal marshes.

Estuaries are extremely important to commercial and recreational fisheries and shellfisheries. The National Marine Fisheries Service estimates that more than 90% of the U.S. commercial catch in the Gulf of Mexico and more than 80% of the commercial harvest on the Atlantic coast consist of species dependent on estuaries during some stage of their life cycle (Lindall and Thayer 1982). Familiar species such as white and brown shrimp, blue crab, seatrout, black and red drum, and menhaden all rely on estuaries as nursery grounds. Young fish migrating from estuaries often become food for larger offshore species such as mackerel, bluefish, and striped bass. Estuaries also provide habitat for anadromous fish species (migrating from salt to freshwater to spawn) such as striped bass, alewife, American shad, and Atlantic sturgeon, and for permanent residents such as clams, oysters, and anchovies. Coastal barriers protect these estuaries from erosion and reduce the effects of waves and thus indirectly protect the estuarine-dependent fisheries. There is some evidence that passes between coastal barriers are a preferred spawning area for certain fishes.

Much of the productivity attributed to estuarine ecosystems is related to the extensive marshes and, in some areas, to seagrass beds found there. Only a fraction of the vast amount of living plant material is eaten by primary consumers, however. The bulk of the plant material dies annually and decomposes as particulate organic detritus in the marsh or on the extensive mud flats. Nutrients from this detritus are transferred through the estuarine food chain to higher trophic levels largely by bottom-dwelling invertebrates and detritus-feeding fishes. Detritus feeders obtain their nutrition primarily from the bacteria, fungi, and protozoa attached to the detrital particles rather than from the relatively resistant plant material. These "detritovores" form the base of a food web leading to secondary and higher consumers which include numerous fishes and birds and are thus an essential component of the estuarine biological community.

Marsh, seagrass, and phytoplankton primary production in the estuary is high because the concentration of organic nutrients is high. Concentrations of nutrients are higher in the estuary than in either coastal marine waters or freshwaters. Both physical processes (e.g., clay particle adsorption of nutrients) and biological processes (e.g., pelletization of nutrient rich particles in the water by suspension-feeding animals, preventing washout) help make the estuary a nutrient trap.

Two of the most common fish species in the estuary are mullet and menhaden. These fish feed primarily on detritus and phytoplankton in the water. Many bottom-feeding fishes (including croaker, spot, drum, and hake) are abundant in estuaries. These fish feed on the tremendous numbers of small invertebrates living in estuarine sediments.

Estuaries boast a prolific assemblage of birds. Subtidal or open-water areas are used for feeding and resting. Species feeding in these areas include scavengers such as certain gulls, fish-eaters such as terns, pelicans, and ospreys, and bottom-feeders such as shorebirds and some ducks. Egrets and herons, by virtue of their size and abundance, are the dominant avian predators in the estuarine marsh on a year-round basis. Small fishes, shrimp, and crabs are the principal food of these wading birds. Other fish-eaters nesting in the marsh include some terns and black skimmers. Numerous shorebirds such as sandpipers and dowitchers probe for food in shallow and intertidal areas, while larger ibises, willets, and rails probe muddy bottoms in somewhat deeper areas. A variety of ducks exploit estuaries. Some are summer residents, while others, including many seaducks, use estuarine areas as an overwintering habitat.

In the marshes, blackbirds, sparrows, marsh wrens, and swallows feed and nest. Several species of hawks and owls make use of marshes as hunting grounds. Also in the marsh, muskrat and nutria are important furbearers, providing a valuable commodity for trappers in Louisiana, Texas, and the Carolinas. Introduced from South America to Louisiana for its fur, the nutria is twice the size of the muskrat but ecologically similar. Both prefer freshwater marsh though they are often found in estuarine areas. Both feed extensively on marsh grasses and sedges.

Aquatic mammals include several species of porpoise, which can be found in virtually every accessible bay and river mouth along the coast. They prey on a variety of fishes, especially mullet and menhaden. Manatees are more restricted in habitat and occur primarily in quiet estuarine waters along the coast of Florida, where they feed on rooted and floating vegetation. Seals are common in estuarine waters along the north Atlantic coast but occasionally range as far south as South Carolina and Georgia.

Freshwater ecosystems. Coastal freshwater ecosystems are designated by salinity, or the concentration of salts in the water column. Freshwater environments have been defined by the FWS (Cowardin et al. 1979) as all wetland systems where the average salinity is less than 0.5 parts salt by weight per 1,000 parts water or 0.5 ppt (average seawater is about 35 ppt). Swamps, bays, marshes, ponds, lakes, and rivers meeting this criteria are considered freshwater ecosystems.

The ecology of freshwater ecosystems is complex due to the almost limitless variety of habitat types present. A reduction in the environmental stresses associated with salinity and tidal fluctuations also contributes to the increase in plant and animal diversity over that of the structurally simpler coastal wetlands such as brackish and salt marshes. Because freshwater environments are not restricted to coastal areas, however, the biological assemblages associated with them are not necessarily unique to coastal regions.

The three fish families with the most species and individuals in freshwater habitats are the minnow-shiner-carp family, the sunfish-crappie-bass family, and the catfish family. While a relatively large proportion of the catfish and sunfish populations extend into tidal freshwater areas, this is not the

case for the minnows which, as a group, are more common in nontidal regions. Sport fisheries in tidal freshwater rivers include striped bass, largemouth bass, white perch, several species of catfish, sunfish, crappie, pickerel, and yellow perch. Each of these species spends at least a part of its life in freshwater habitats.

In the Southern States, alligators are frequently found in freshwater wetlands. The alligator's diet includes birds, fish, turtles, snakes, and small mammals. Many of the same bird species found in neighboring estuarine habitats can be found in freshwater wetlands also, but a high diversity of other bird life can be found as well. Low marsh and adjacent exposed mudflats are used by shorebirds and rails. The grasses and sedges characteristic of higher elevations in the marsh are similar to grassland and savannah habitats and support an abundance of seed-eating species. Tidal channels and pools provide habitat for wading birds. Waterfowl use the open-water areas in addition to the marsh surface itself. Shrubs and trees found in the high marsh and the upland marsh edge provide habitat for a large number of passerines, which are often found feeding in the marsh proper, and for raptors such as the osprey, which nest in large trees near pond areas and on dead snags, channel markers, and power line poles in the riverine system. Because of the great similarity between lacustrine, palustrine, and riverine habitats and because birds are so mobile, the avifauna of all three habitats are similar. Birds from each area are often interspersed with the others, and the individual trophic relationships for each are not well defined.

Upland ecosystem. The upland ecosystem includes all non-maritime coastal uplands. These areas illustrate a tremendous variety of geographic and vegetative conditions. A detailed characterization of the upland ecosystem is not necessary for the purposes of this chapter because upland ecosystems are not restricted to coastal areas. While many of the species described previously can be found in upland areas, the fauna of coastal uplands are, for the most part, not uniquely coastal species. Coastal uplands harbor a greater variety of habitat types and, therefore, a correspondingly greater diversity of terrestrial mammals, birds, reptiles, and amphibians than that found in other coastal habitats.

Summary. This discussion of coastal barrier ecosystems has focused on the physical factors limiting plant and animal distributions; biological factors, however, can play an equally important role. The distribution and particularly the abundance of many organisms within an ecosystem are also controlled by biological processes such as competition among functionally similar species, predation, and mutualistic relationships among species. For example, competition for space and light helps determine which plant species are found in the maritime shrub zone and forest. Predation by birds, fishes, whelks, and crabs can control the abundance of many benthic invertebrates, including commercially important shellfish. The presence of one organism in a particular habitat may make it more or less suitable for other organisms. For example, seagrasses allow higher densities of many benthic invertebrates and fishes by protecting them from other predators. High densities of sediment-disturbing animals like burrowing clams and shrimp may exclude other animals that need a stable substrate. Mobile species such as birds, fishes, and mammals play the important role of transferring energy from one ecosystem

to another. For example, juvenile fish incorporate much of the production of the estuary into their growing bodies. When these fish leave the estuary and join the coastal marine system, the food webs of these two ecosystems are connected as these fish fall prey to their oceanic predators.

Five interrelated ecosystems have been described; the important word is "interrelated." Each of these systems contributes something to the other and no single system is independent of the others. Many species occupy more than one ecosystem on either a daily (birds moving from roosting sites to feeding areas), seasonal (migratory waterfowl), or annual (certain fishes moving into estuaries and rivers to spawn) basis. In some cases the distinction between ecosystems is difficult to determine; in others it is sharply defined. Regardless of ecosystem boundaries though, the fish and wildlife present are part of a complex, interacting system of natural resources linked to the marine environment and, in numerous instances, are preserved and maintained by the regional coastal barrier geography.

Regional Presentation of Fish and Wildlife Resources

This section will briefly describe fish and wildlife resources within the CBRS and where CBRS units are proposed on the Atlantic Ocean and Gulf of Mexico coasts. Table 1 presents an overview of the most common ecosystems and special features found in each region. The following discussions highlight the species, habitats, and CBRS units of special significance. Tables 2 and 3 are a compilation of fish and wildlife species occurring within the CBRS that have been designated as either endangered or threatened species, pursuant to the Federal Endangered Species Act or listed as "National Species of Special Emphasis" (NSSE) by the FWS. The species on this list have been selected according to biological, political, social, and economic criteria from the total range of species for which the FWS has legal responsibility. The NSSE list is frequently updated to reflect changes in management emphasis and species status. The selection of individual species is guided by the overall mission of the FWS to provide the Federal leadership to conserve, protect and enhance fish and wildlife and their habitats for the continuing benefit of the people. Table 2 lists the ecosystems discussed in the previous section and indicates the species that are most commonly associated with them. Table 3 indicates the region of the country where each species is likely to occur.

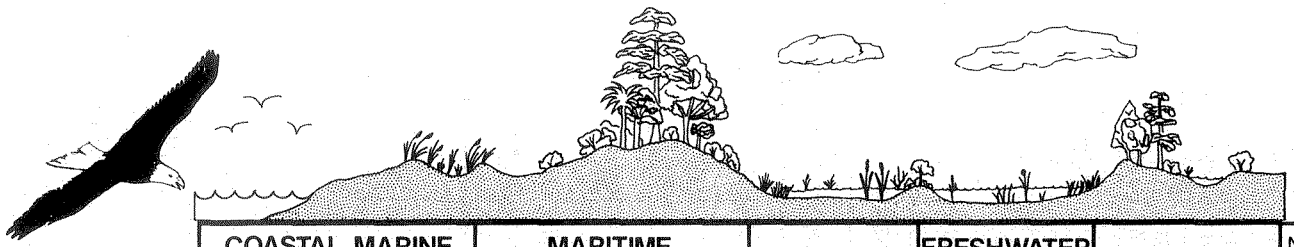
For the purposes of this section, the Atlantic and gulf coast has been classified into 17 regions based on various physical and ecological factors (Figures 10 and 11). This classification scheme has been adopted to simplify discussion of fish and wildlife resources associated with coastal barriers. It is slightly different from the regional classification system used in the previous chapter. Coastal barriers within the same coastal region will generally have similar natural resources. These barriers are discussed as a group; however, coastal barriers with special significance are considered individually.

Northern Gulf of Maine. Among the most significant wildlife associated with the coastal barriers in this section are bald eagles and ospreys, both of which nest in several of the existing CBRS units. Both species are uncommon

Table 1. Common ecosystems and special features found in each region along the Atlantic and Gulf of Mexico coasts.

REGION	COMMON ECOSYSTEMS					COMMENTS AND SPECIAL FEATURES
	COASTAL MARINE	MARITIME	ESTUARINE	FRESH-WATER	UPLAND	
Northern Gulf of Maine	X		X	X		Tide-pool communities on rocky shores common. Extensive bogs in freshwater ecosystem.
Southern Gulf of Maine	X		X	X		Few rocky, more sandy, or cobble beaches. Wide intertidal flats in estuaries, bogs.
Southern New England	X	X	X			Sandy beaches, dune system on barriers, marsh behind.
New York Bight	X	X	X	X		Dune systems on islands, extensive marshes.
Delaware Bay			X	X		Extensive marshes, some oyster reefs.
Delmarva Shore			X	X	X	Extensive marsh, oyster reef, well developed dune community in northern NC, long, narrow barriers.
Chesapeake Bay			X			Marshes, seagrass beds, and oyster reefs common.
North Carolina Coast	X	X	X	X		Extensive marshes, well developed dune community, oyster reef.
Sea Islands	X	X	X	X	X	Shorter, thicker barriers, extensive maritime forest, oyster reef, very extensive marshes.
East Florida	X		X			Low beaches, less extensive marshes, very extensive seagrass beds.
Biscayne Bay	X		X	X		Mangroves and seagrass beds extensive.
Florida Keys	X		X			Coral reefs, mangroves, and seagrass beds extensive.
Ten Thousand Islands	X		X	X		Mangroves and seagrass beds extensive.
Central Barrier Coast	X		X	X		Extensive marshes, swamps, mangroves.
Big Bend Drowned Karst	X		X			Wide shallow zone, extensive seagrass beds, marshes, oyster reefs.
Apalachicola Cuspate Delta	X		X			Extensive flats, little seagrass, oyster reefs.
North Central Gulf Coast	X	X	X	X	X	Sandy beaches with well developed dune community, marshes and pine savannah common.
Mississippi Delta	X		X	X	X	Most extensive marsh system (salt and fresh), extensive shallow areas, bottomland hardwood.
Strandplain-Chenier Plain System	X		X	X		Very extensive marsh systems.
Texas Barrier Island System	X		X			Marshes upper coast, seagrass beds and mangroves lower coast.

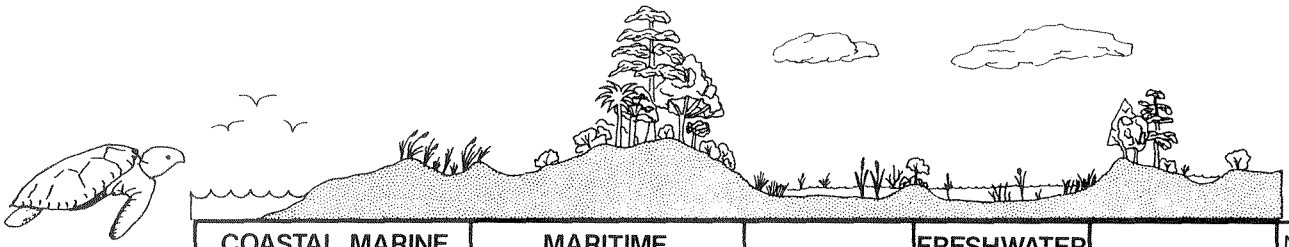
Table 2. U.S. Fish and Wildlife Service's National species of special emphasis and endangered and threatened species and their associated coastal barrier ecosystems (adapted and expanded from McKenzie and Barclay 1980).



SPECIES	COASTAL MARINE		MARITIME			ESTUARINE	FRESHWATER	UPLANDS	NATIONAL SPECIES OF SPECIAL EMPHASIS	ENDANGERED/ THREATENED
	SUBTIDAL INTERTIDAL	BEACH	DUNES	TRANSITION SHRUB	MARITIME FOREST		RIVERINE-LACUSTRINE PALUSTRINE			
AMERICAN PEREGRINE FALCON	X	X				X	X		X	X
BALD EAGLE	X				X	X	X	X	X	X
AMERICAN BLACK DUCK	X					X	X		X	
ATLANTIC BRANT	X					X			X	
CANADA GOOSE						X	X		X	
CANVASBACK						X	X		X	
EASTERN BROWN PELICAN	X	X				X			X	X
LEAST TERN	X	X	X			X			X	X
MALLARD						X	X		X	
OSPREY	X	X			X	X	X		X	
PIPING PLOVER		X	X			X			X	
REDHEAD						X			X	
ROSEATE TERN	X	X	X			X			X	
SNAIL KITE							X		X	X
GREATER SNOW GOOSE	X					X	X		X	
TUNDRA SWAN						X	X		X	
WHITE-FRONTED GOOSE						X	X		X	
WHOOPING CRANE						X	X		X	X
WOOD DUCK						X	X		X	

(continued)

Table 2. (Concluded).



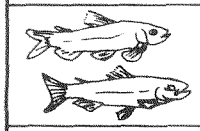
SPECIES	COASTAL MARINE		MARITIME			ESTUARINE	FRESHWATER	UPLANDS	NATIONAL SPECIES OF SPECIAL EMPHASIS	ENDANGERED/ THREATENED
	SUBTIDAL INTERTIDAL	BEACH	DUNES	TRANSITION SHRUB	MARITIME FOREST		RIVERINE-LACUSTRINE PALUSTRINE			
ATLANTIC LOGGER-HEAD SEA TURTLE	X	X							X	X
GREEN SEA TURTLE	X	X							X	X
KEMP'S RIDLEY SEA TURTLE	X	X							X	X
LEATHERBACK SEA TURTLE	X	X							X	X
										
SHORT-NOSED STURGEON	X					X	X		X	X
STRIPED BASS	X					X	X		X	X
										
BEACH MICE (SEVER/ SUB-SPECIES)		X	X							X
COYOTE		X	X	X	X			X	X	
CUMBERLAND ISLAND POCKET GOPHER			X						X	
DELMARVA FOX SQUIRREL					X			X		X
WEST INDIAN MANATEE						X	X		X	X
										
AMERICAN ALLIGATOR						X	X		X	

Table 3. U.S. Fish and Wildlife Service's National species of special emphasis and endangered and threatened species and their occurrence within the coastal sections of the Coastal Barrier Resources System.

SPECIES	NORTHERN GULF OF MAINE	SOUTHERN GULF OF MAINE	SOUTHERN NEW ENGLAND COAST	NEW YORK BIGHT	DELAWARE BAY	DELMARVA SHORE	CHESAPEAKE BAY	NORTH CAROLINA COAST	SEA ISLANDS	EAST FLORIDA	BISCAYNE BAY	FLORIDA KEYS	TEN THOUSAND ISLANDS	CENTRAL BARRIER COAST	BIG BEND DROWNED KARST	APALACHICOLA CUSPATE DELTA	NORTH-CENTRAL GULF COAST	MISSISSIPPI DELTA	STRANDPLAIN-CHENIER PLAIN SYSTEM	TEXAS BARRIER ISLAND SYSTEM	NATIONAL SPECIES OF SPECIAL EMPHASIS	ENDANGERED/ THREATENED
AMERICAN PEREGRINE FALCON	X	X	X	X	X	X	X	X				X			X	X	X	X	X	X	X	X
BALD EAGLE	X	X	X	X	X	X	X	X	X				X	X	X	X	X				X	X
AMERICAN BLACK DUCK	X	X	X			X	X	X										X	X	X	X	
ATLANTIC BRANT	X	X	X	X	X	X	X														X	
CANADA GOOSE	X	X	X	X	X	X	X											X	X	X	X	
CANVASBACK		X	X	X	X	X	X										X		X		X	
EASTERN BROWN PELICAN						X	X	X	X	X			X	X		X	X	X	X		X	X
LEAST TERN		X	X	X		X		X	X					X	X	X	X	X	X		X	
MALLARD		X	X			X	X	X	X									X	X	X	X	
OSPREY	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X			X	
PIPING PLOVER	X	X	X			X	X								X						X	X
REDHEAD						X	X	X							X		X	X	X	X	X	
ROSEATE TERN		X	X																		X	
SNAIL KITE										X				X							X	X
GREATER SNOW GOOSE				X	X	X	X	X										X	X	X	X	
TUNDRA SWAN				X	X	X	X	X										X	X		X	
WHITE-FRONTED GOOSE																		X	X	X	X	
WHOOPING CRANE																				X	X	X
WOOD DUCK			X		X													X	X		X	

(continued)

Table 3. (Concluded).

SPECIES	NORTHERN GULF OF MAINE	SOUTHERN GULF OF MAINE	SOUTHERN NEW ENGLAND COAST	NEW YORK BIGHT	DELAWARE BAY	DELMARVA SHORE	CHESAPEAKE BAY	NORTH CAROLINA COAST	SEA ISLANDS	EAST FLORIDA	BISCAYNE BAY	FLORIDA KEYS	TEN THOUSAND ISLANDS	CENTRAL BARRIER COAST	BIG BEND DROWNED KARST	APALACHICOLA CUSPATE DELTA	NORTH-CENTRAL GULF COAST	MISSISSIPPI DELTA	STRANDPLAIN-CHENIER PLAIN SYSTEM	TEXAS BARRIER ISLAND SYSTEM	NATIONAL SPECIES OF SPECIAL EMPHASIS	ENDANGERED/ THREATENED
ATLANTIC LOGGERHEAD SEA TURTLE								X	X	X				X	X	X	X				X	
GREEN SEA TURTLE										X											X	
KEMP'S RIDLEY SEA TURTLE																				X	X	
LEATHERBACK SEA TURTLE										X											X	X
SHORTNOSED STURGEON			X	X	X	X	X	X	X	X												X
STRIPED BASS	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X
BEACH MICE (SEVERAL SUB-SPECIES)			X									X		X	X		X					X
COYOTE									X										X	X	X	
CUMBERLAND ISLAND POCKET GOPHER									X										X		X	
DELMARVA FOX SQUIRREL						X																X
WEST INDIAN MANATEE									X	X			X	X	X	X					X	X
AMERICAN ALLIGATOR								X	X	X	X			X	X	X	X	X	X	X	X	

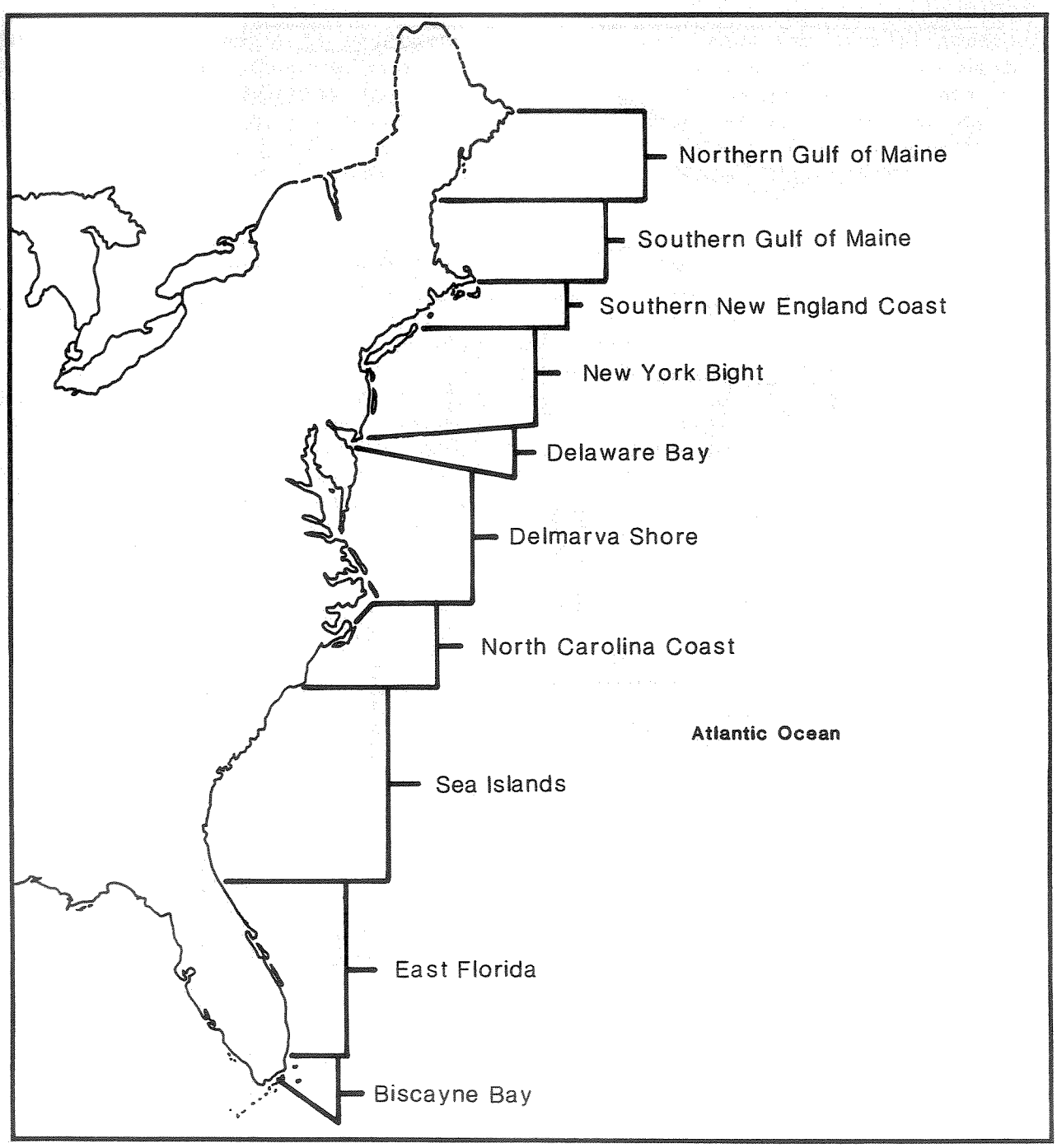


Figure 10. Atlantic coast of United States showing various coastal regions described in this chapter.

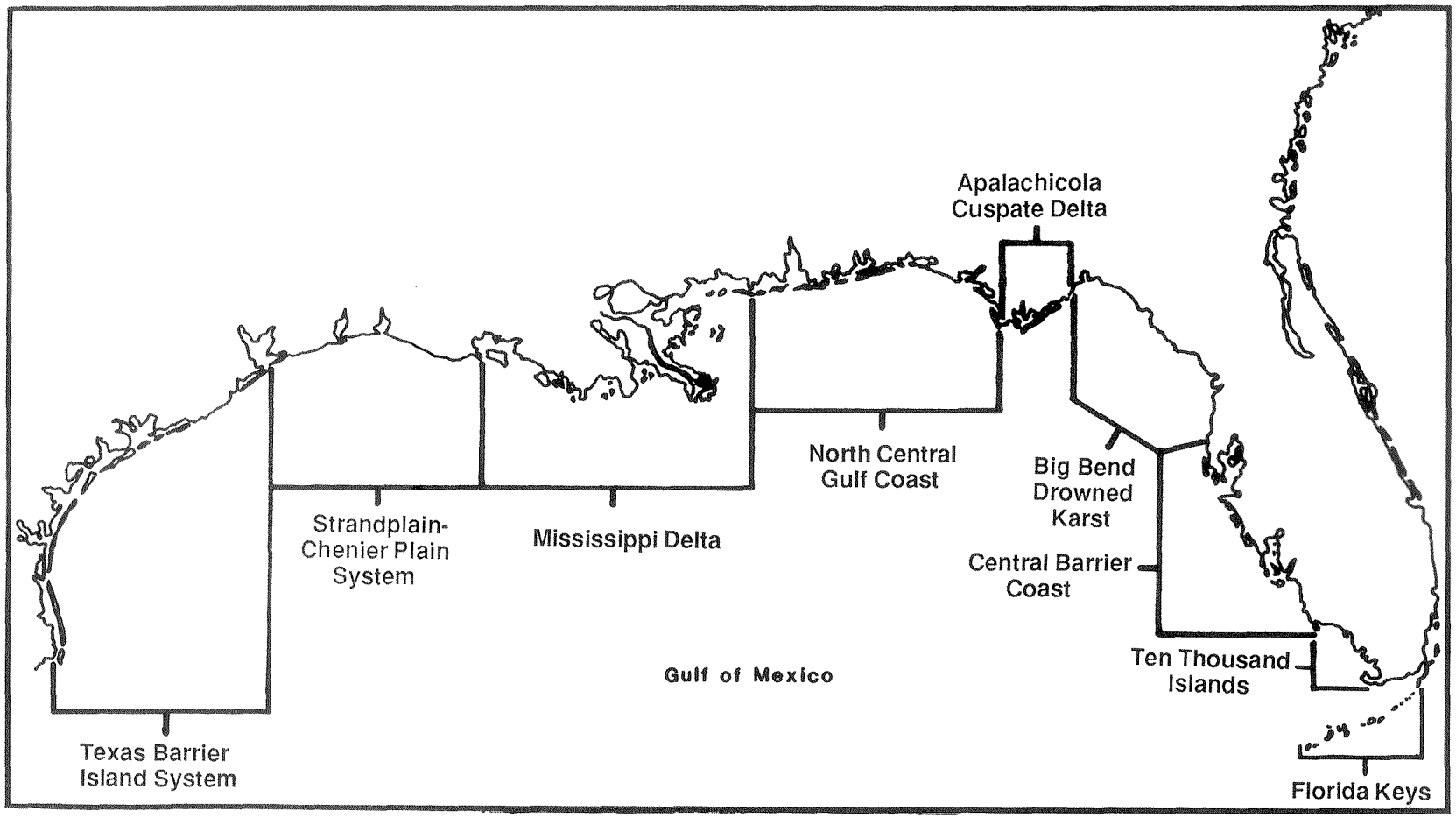


Figure 11. Gulf coast of United States showing various coastal sections described in this chapter.

birds; the bald eagle is endangered and, therefore, receives special protection under the Endangered Species Act. The sensitivity of these birds to environmental degradation has made them symbols of ecological good health. The remote and largely undeveloped coast of northern Maine is well suited to support such birds. Other resources present include shellfish, such as soft clams and lobsters, and migratory shorebirds, including plovers, sandpipers, and whimbrels.

Southern Gulf of Maine. Many of the coastal barriers within this region are seasonally populated by a variety of birds. Summer residents include snowy and great egrets, black-crowned night-herons, glossy ibises, and nesting colonies of common, Arctic, roseate, and least terns. Sandy Neck (existing CBRS unit C09), on Central Cape Cod, is attractive to a variety of migratory waterfowl as well as several northern passerine species that prefer sparsely vegetated, windswept areas. These include larks, pipits, and snow buntings. Two other noteworthy species present at Sandy Neck are the rare Ipswich sparrow, which occasionally winters in this area, and the threatened piping plover. Striped bass and alewife, both anadromous, are locally important fishes, and the northern diamond back terrapin is also found along this section of the coast.

Southern New England coast. Fifty-nine CBRS units now exist within the southern New England coastal section, more than three times as many as any other coastal section. Although many of these units are small in size, their number and variety are an indication that even in one of the most densely populated areas in the country some undeveloped and unspoiled areas remain.

As is the case throughout the CBRS, the most conspicuous wildlife are the birds. Familiar coastal species including terns, gulls, herons, and egrets are abundant. Most of the continental population of roseate terns nest in this region. But more importantly, the coasts of Massachusetts, Rhode Island, Connecticut, and New York all lie along the migratory route of tens of thousands of birds that rely on these areas for food and shelter during their semiannual migrations. Large populations of waterfowl, including Canada geese and black ducks, use coastal marshes, and shorebirds such as yellowlegs, whimbrels, piping plovers, and spotted sandpipers frequent mudflat and beach areas during migration. Existing CBRS units on Martha's Vineyard (C26-C29B), Nantucket Island (C20, C25), the Elizabeth Islands (C31), and Block Island (D09) contain habitat important to migratory birds. Milford Point (E07) is one of the few known nesting sites for the threatened piping plover. Remote and undisturbed areas of these and other islands in this section are regularly used by migrating peregrine falcons and resident bald eagles. Gardiner's Island (F09) has a large population of nesting ospreys.

Commercial and recreational fisheries in this section include clams and scallops as well as bluefish and the anadromous striped bass and alewife. An unusual species occurring in the region is the gray seal. The only known breeding site south of Canada for gray seals is at Muskeget Island (C25), near Nantucket in Massachusetts. All of Muskeget Island is included in the CBRS. This island was also once the site of the largest tern colony in New England, but the colony has now been overrun by seagulls.

New York Bight. For the most part, the coastal barriers in this section are extensively developed and there are only four existing CBRS units. All of these are on the seaward side of Long Island. Napeaque (F10) is probably the most significant of these in terms of wildlife. A well-developed dune system provides habitat for numerous small animals such as mice and rabbits and, as a result, raptors use this area for hunting. Napeaque is an important stopover point for hawks, owls, and falcons migrating to and from New England. In particular, peregrine falcons, northern harriers, and short-eared owls have been observed in the area.

Shellfish found along the coast include surf clams, New Jersey's most important commercial fishery, and hard and softshell clams. Major fin fisheries include bluefish, hake, flounder, weakfish, and croaker. Less common are striped bass, American shad, and Atlantic sturgeon. Most of these species are present from spring to fall in bays and nearshore waters but tend to migrate offshore to deeper waters during the winter. In addition, five species of sea turtle inhabit New Jersey's coastal waters. The most prominent is the loggerhead which may occasionally nest along secluded beaches.

The New Jersey shoreline is both an important nesting area and a migratory route for thousands of birds. During the spring and summer large numbers of wading birds and shorebirds, including common and least terns, laughing gulls, black skimmers, snowy egrets, little blue herons, black-crowned night-herons, and glossy ibises, nest along coastal barriers and nearby wetlands. In the fall, songbirds migrating along the coast concentrate at Cape May in spectacular numbers. Many ducks and geese also migrate along the New Jersey coast, some wintering in sheltered bays and estuaries. Migrating with shorebirds along the coast are peregrine falcons. Bald eagles and ospreys are present in small numbers year round.

Delaware Bay. The Broadkill Beach Complex (H00), near the mouth of the Bay on the southwest shore, is the only CBRS unit now existing in this coastal section. The marshes included in this unit are populated by a variety of shorebirds and waterfowl, as well as northern harriers and ospreys, and by mammals such as the raccoon, red fox, and whitetail deer.

The Delaware Bay Estuary extends inland to Trenton, New Jersey, the limit of tidal influence. Its partially protected mouth lies between Cape May, New Jersey, and Cape Henlopen, Delaware. Extensive marshes are present along the shoreline of the bay as far inland as Philadelphia, Pennsylvania. Tidal energy within Delaware Bay is twice that of the much larger Chesapeake Bay to the south. This estuary is highly productive and diverse and provides habitat for a wide variety of fish and wildlife species.

Commercially important shellfish in this area include oysters, mussels, hard clams, lobsters, and blue crabs. Blue crab is the major commercial species and is fished throughout the bay. Anadromous fish present include Atlantic sturgeon, American shad, alewife, herring, and striped bass. In addition, the endangered shortnose sturgeon is distributed throughout the estuary below Trenton.

Extensive marsh and mudflat areas provide habitat for numerous wading birds, shorebirds, ducks, and geese and provide nursery areas for shellfish and finfish populating the open-water areas. Common shorebirds include greater and lesser yellowlegs; least, semipalmated, and western sandpipers; marbled godwits; and black-necked stilts. Several species of gulls and terns, including royal, caspian, roseate, and black terns, and large populations of loons and grebes are present throughout the year in the bay. Wading birds, including little blue herons, tricolored (Louisiana) herons, snowy egrets, and glossy ibises, are also present.

Other wildlife present in marsh areas include whitetail deer, squirrels, fox, muskrats, and some otter. The rare eastern tiger salamander and bog turtle are also found here.

Delmarva Shore. The Delmarva Shore section includes parts of Delaware, Maryland, Virginia, and North Carolina. The tidal flats of the barriers from Assateague to Fisherman Island attract many thousands of shorebirds during their spring and fall flights and the numerous creeks and channels in between these islands serve as refuge for multitudes of migratory ducks and geese. Beach and dune areas are important habitats for colonially nesting terns and gulls, some migratory shorebirds, and raptors.

Cedar Island (K03), which is entirely within the CBRS, contains a variety of habitat types and is representative of the CBRS units within this coastal section. Colonial nesters include common, gull-billed, royal, Forster's and least terns, as well as laughing and herring gulls, and willets. Brown pelicans reach the northern extent of their range in this region, and coastal habitats here also attract ospreys and bald eagles. Seasonally present in the marsh areas and open channels are waterfowl such as Canada and snow geese, brants, pintails, mallards, gadwalls, green-winged teals, and many others. These birds, as well as migratory shorebirds such as whimbrels, dowitchers, sanderlings, and plovers, attract peregrine falcons, which also migrate along the coast and feed almost exclusively on small- to medium-sized birds.

Other resources present in this section of the coast include mice, moles, shrews, and rabbits in dune and shrub areas, and oysters and clams in shallow water areas. Sport fishing for species such as bluefish and croaker is also important.

Chesapeake Bay. The Chesapeake Bay, with nearly 1.5 million acres of water and 4,000 mi of undulate shoreline, is the largest estuary in the United States. It extends almost 200 mi from the Conowingo Dam on the Susquehanna River to Cape Henry and Cape Charles at the mouth of the bay to the south. Smaller estuarine tributaries that are a part of Chesapeake Bay include the Potomac, Rappahannock, York, and James Rivers. The bay is generally shallow and protected from high energy ocean influence. Salinities are higher in the lower, southern end of the bay and generally decline northward. Marshes are extensive, particularly along the eastern side of the bay.

Although the Chesapeake Bay includes several different components--the bay itself, the wetlands, and the various tributaries--it is a single ecosystem (Green 1978). The impacts of human activities and the network of species

interactions span the entire bay. Fish, blue crabs, and waterfowl move throughout the bay, and pollutants which enter at one spot can be carried throughout the bay. Because the Chesapeake is so large and contains a wide variety of habitats, it supports a great diversity of fish and wildlife resources. The distribution of various species depends on salinity, depth of water, time of year, and the availability of suitable habitat.

Both commercial and recreational fisheries are extremely important in the Chesapeake Bay. Estuarine shellfish species make up the majority of the valuable Chesapeake harvest. For example, the annual harvest of blue crabs in 1983 was about 95 million lb, half of the total U.S. blue crab catch (National Marine Fisheries Service 1984). Oyster production in the bay in 1983 was worth more than $16 million, nearly one-fourth of the total U.S. harvest (National Marine Fisheries Service 1984). Soft and hard shell clams are also caught in the bay. Oysters and clams are more abundant in mid-salinity portions of the bay, while blue crabs are more common in higher salinity areas (> 15 ppt) (Becassio et al. 1980). Higher salinity areas also typically have the highest recreational and commercial yield for many finfish species. These include bluefish, seatrout, menhaden, and drum. Menhaden is the most valuable finfish in the bay and makes up the majority of the commercial fishing poundage. In addition, much of the Atlantic coastal fisheries of North America are spawned and spend a critical part of their lives as juveniles in Chesapeake Bay.

Several anadromous species, once abundant in the Chesapeake Bay, have suffered dramatic declines in recent years. These include shad, herring, and striped bass. Causes of these declines are not well understood, however; there are undoubtedly numerous factors involved, including overfishing and increased sediment and nutrient runoff into the bay from agricultural and other nonpoint sources. These factors may also be contributing to the disappearance of submerged vegetation in some areas of the Chesapeake, which may, in turn, be an important cause of the decline in oyster, clam, bay scallop, striped bass, and waterfowl populations.

The Chesapeake Bay provides habitat for more than 75% of the waterfowl migrating along the Atlantic coast. Of the more than one million waterfowl that migrate to the bay, about 550,000 ducks and 350,000 geese winter in tidewater areas. The most numerous and widely distributed ducks include mallards, canvasbacks, black ducks, scaups, and scoters.

Many shorebirds and wading birds also migrate to and from Chesapeake Bay as the seasons change. Resident species that nest in the bay area include great blue herons, snowy egrets, great egrets, common terns, least terns, and black skimmers. Uncommon birds found in the Chesapeake Bay include bald eagles, ospreys, and migrating peregrine falcons.

Noteworthy mammals present in marsh and upland areas along the Chesapeake Bay shoreline are beaver, river otter, white tail deer, and muskrat. The muskrat is common in brackish water marshes along the lower eastern shore; more than 400,000 are harvested annually (Becassio et al. 1980). The tiger salamander, endangered in Maryland and Virginia, is also found in the bay area.

North Carolina coast. The North Carolina coast is the northernmost extent of significant sea turtle nesting activity. Although several species of sea turtles occur in the coastal waters, the loggerhead is the principal species using this area's relatively remote barrier beaches for nesting. Sea turtles decreased in range and numbers due to human exploitation and loss of habitat. State and Federal legislation has been passed to protect these animals with the hope that their populations can recover. The preservation of nesting habitat in areas such as the beaches of North Carolina represents an important step in this direction.

Another denizen of coastal habitats, at the northern extent of its range in this region, is the American alligator. Like the sea turtles, alligator populations have been reduced throughout their range and are therefore also protected by Federal and State laws. These actions have begun to pay off as populations in coastal and other areas have slowly increased. Although they prefer freshwater habitat, alligators can often be found in brackish marsh and even occasionally in salt marsh. Examples of each of these areas can be found landward of North Carolina's barrier islands and beaches.

Other wildlife present include a variety of shorebirds, nesting populations of least terns and black skimmers, as well as coastal raptors such as marsh hawks, ospreys, and bald eagles. Brown pelicans are present, and migratory peregrine falcons are regular visitors. Oysters and clams are found in quiet backbay areas, while anadromous alewife, shad, and herring, as well as spotted seatrout, menhaden, and flounder, are locally important fisheries.

Sea Islands. The Sea Islands section of South Carolina and Georgia features smaller and more numerous barrier islands than the North Carolina and Delaware sections. Many of the islands are covered by maritime forest and have extensive adjacent marshes.

Numerous species of shorebirds, including dunlins, dowitchers, willets, and oyster catchers, are permanent residents of this coast because the climate is generally mild. A number of herons and egrets are resident as well. These include great blue, tricolored (Louisiana) and little blue herons, and snowy and great egrets. A number of waterfowl are winter residents only, moving north in the spring to breed. These include scaups, mergansers, scoters, canvasbacks, redheads, and goldeneyes. Brown pelicans, bald eagles, and ospreys are also common within the Sea Islands section.

As in the North Carolina section, the loggerhead turtle is the only marine turtle nesting in this region, and it uses most of the barrier island beaches, including nearly all of the CBRS units designated in this region. Females may nest as many as five times during a nesting season that generally extends from mid-May through mid-August. Alligators inhabit the fresh and brackish marsh areas along the Sea Islands coast.

Some of the locally important estuarine fishes and shellfishes associated with coastal barriers in this section include oysters, blue crab, spotted seatrout, red drum, and bluefish. The shortnosed sturgeon, a species with special status due to its depleted numbers, is also present.

Another estuarine inhabitant is the manatee. These slow moving, aquatic mammals are more common in Florida but can sometimes be found in quiet estuaries throughout the Sea Islands section. Manatees have suffered major population reductions due to loss of habitat and to recreational and commercial boating accidents. They are closely protected in their remaining range.

East Florida. Important wildlife resources in this section are the nesting colonies of herons and egrets found at Vero Beach and Hutchinson Island (existing CBRS units P10 and P11). Great blue, little blue, and tricolored (Louisiana) herons, snowy egrets, and wood storks, as well as black skimmers, least terns, double-crested cormorants, and brown pelicans can be found nesting in marsh and mangrove habitats in and around these two CBRS units. Although the total number of breeding species is relatively small, winter concentrations are often large. In the winter, lesser scaup and American coot are the most abundant waterfowl.

Loggerhead sea turtles nest throughout the East Florida coast, as do green and leatherback sea turtles, although to a lesser degree. It is estimated that up to 20,000 loggerhead nests are made in Florida each year by about 14,210 females, making up 90% of the total U.S. population. Along the Atlantic coast, the green sea turtle nests only in Florida, where its population is estimated at about 50 native females. Leatherback turtle nests along the Atlantic coast are rare, but some 10 to 12 nests occur annually in east Florida. The area extending from Cape Canaveral to West Palm Beach, particularly Hutchinson Island and Jupiter Island, on the seaward side of the Indian River, is the major sea turtle nesting area along the Atlantic coast.

About half of the Florida manatee population (750 to 850 total individuals) lives in east Florida. The center for the manatee population in east Florida is in the St. Johns River and between Ponce de Leon Inlet and Hobe Sound.

Clams, blue crab, and oysters are locally important commercial and recreational fisheries, although white and brown shrimp are the most valuable commercial shellfish in this section. King and spanish mackerel and snappers are the most valuable finfish although menhaden is the major commercial species harvested by volume.

Biscayne Bay. North Beach (14A) is the only existing CBRS unit in the Biscayne Bay coastal section. Noteworthy wildlife found in Biscayne Bay include manatees and nesting loggerhead sea turtles. Other species that may occasionally be found at North Beach are bald eagles, ospreys, and migrating peregrine falcons. Fishery resources are similar to those in previous Florida coastal sections and include spiny lobsters, the most valuable fishery in this region, and stone crabs.

Florida Keys. The Florida Keys section at the southern tip of Florida extends approximately 230 mi from Biscayne Bay to Key West and the Dry Tortugas. The area consists of a series of low limestone islands, typically with fringing mangroves and extensive seagrass beds along the inner, northwest shores, and with rocky pinnacles or narrow beaches extending into coral reefs along the outer shores. These coral reefs and the Keys themselves represent the most

extensive coral reef habitat in the continental United States and are remnants of a once massive ancient coral formation.

The abundant coral reef and seagrass habitats in the Florida Keys support a great variety of recreationally and commercially important shellfish resources. Among these are spiny lobster, stone crab, and pink shrimp. These habitats also support large numbers of fish. In fact, the combination of favorable water temperatures, variety and abundance of foods, and diverse nursery grounds and breeding habitats results in an extremely rich fish fauna of over 500 species. Many of these fish, particularly members of the snapper and grouper families, provide important recreational and commercial fisheries.

The isolation of the Florida Keys from the mainland is believed to be responsible for the distinctive endemic populations of reptiles, amphibians, and mammals. Although over 40 species of reptiles and amphibians are found in the Florida Keys, decreasing habitat and lack of freshwater have contributed to the sparse distribution of some species, and many are listed as endangered (e.g., Atlantic ridley, hawksbill and green sea turtles, and the American crocodile) or threatened (e.g., Atlantic loggerhead turtle, Florida ribbon snake, Key mud turtle).

A number of birds with special status are found in the Florida Keys. These include Kirtland's warbler, white-crowned pigeon, great white heron, magnificent frigatebird, roseate tern, brown pelican, bald eagle, and peregrine falcon. Numerous wading birds, including the great blue heron, snowy egret, and roseate spoonbill, and shorebirds such as the snowy plover, American oystercatcher, sooty tern, and laughing gull are also present. The Keys also serve as temporary stopping sites for many migrating land birds that arrive in early spring and fall each year. While land bird distribution in the Keys is limited by availability of habitat, the region is a virtual haven for coastal aerial feeding birds such as terns and gulls because of the abundant marine life and relatively shallow waters. The Great White Heron National Wildlife Refuge protects North America's largest wading bird, the great white heron, found only in the Keys and southern Florida. The only known nesting sites for the magnificent frigatebirds, sooty terns, and brown noddies in the continental United States are located in the Keys.

Few species of mammals are found in the Florida Keys because suitable terrestrial habitat is lacking. Those species that are present tend to show a high degree of endemism because of their isolation from mainland populations (Schomer and Drew 1982). Unique species include the Key Vacca raccoon, Key Largo woodrat, Key Largo cotton mouse, silver rice rat, and the diminutive Key deer, which is only as tall as an average-size dog. The National Key Deer Refuge includes several islands and contains nearly all of the 300-400 Key deer remaining (Becassio et al. 1982).

Ten Thousand Islands. The Ten Thousand Islands section of Florida extends from Cape Sable to Cape Romano on the southwest coast. The coastline consists of a complex mosaic of mangrove islands, shallow embayments, and tidal channels. Mangrove swamps, extending inland up to 12 mi along river channels, provide an effective and resilient barrier to the ocean and are inhabited by a unique biological assemblage of fish and wildlife. The Continental Shelf in

this area is very broad and regular, and although both seagrass beds and coral are much reduced compared to the Florida Keys, some coral reef species form characteristic communities in nearshore areas.

The mangrove swamps of the Ten Thousand Islands section provide important nursery areas for numerous species of fish and shellfish, some of which represent major commercial and recreational fisheries. These include pink shrimp, white mullet, red drum, and spotted seatrout. Other important species which use mangrove areas for feeding and shelter include the spiny lobster, stone crab, bluefish, tarpon, and several species of snapper and grouper.

Much of the Ten Thousand Islands section is currently under the stewardship of various Federal and State parks. Everglades National Park, Cape Romano-Ten Thousand Islands Aquatic Preserve, and Fakahatchee Strand State Preserve are three of the largest, protecting many thousands of acres of unique coastal habitat. This habitat not only provides food and shelter for the rich coastal fisheries, but also harbors numerous endangered or threatened species of birds and mammals.

Special status birds present along this coast include the wood stork, Everglades kite, bald eagle, brown pelican, and Cape Sable seaside sparrow. Roseate spoonbills, reddish egrets, and many other wading birds are also present. Gulls, terns, uncommon raptors such as the scissor-tailed kite, and unique waterfowl such as fulvous whistling ducks are found in this section as well. More than 300 bird species have been identified in Everglades National Park; 80 are regular nesters.

Critical habitat for the West Indian manatee extends through the Ten Thousand Islands section. This area supports most of the manatee population living along Florida's west coast and is an important concentration area for all gulf manatees during winter months. Other mammals typically present include bobcats, mink, whitetail deer, rabbits, squirrels, raccoons, and skunks. Uncommon species present include the Florida panther, the mangrove fox squirrel, and the Florida black bear. Loggerhead sea turtles nest along available sandy beach habitat, and American alligators are found in some locations.

Central barrier coast. The extensive shallow marsh and mangrove areas in this coastal section are particularly attractive to numerous birds. These include waders such as wood storks, white ibises, roseate spoonbills, and great blue herons; fish-eaters such as white pelicans, double-crested cormorants, ospreys, and bald eagles; and scavengers such as the magnificent frigatebird. Many species of waterfowl winter in these areas, including pintails, northern shovelers, blue-winged teals, and lesser scaups. Numerous resident and migrating shorebirds are present as well, feeding either on the beaches or in tidal flats behind beach areas. The beaches and marshes are also used by loggerhead, green, hawksbill, and Kemp's ridley sea turtles, terrapins, and alligators.

Shellfish important in the region include pink shrimp, stone crab, blue crab, scallops, and quahog clams. Stone crabs are a unique commercial fishery in Florida although pink shrimp are the most important in terms of yield and

value. The Sanibel shrimp grounds located off Charlotte County yield almost 30% of west Florida's commercial pink shrimp catch. Many of these shrimp are nurtured in the Charlotte Harbor estuary nursery grounds.

Estuarine-dependent commercial finfisheries include drum, mullet, and gulf flounder. Sport fisheries include tarpon, snook, king and Spanish mackerel, and bluefish.

Big Bend drowned karst. Atsena Otie Key (P25), one of three existing CBRS units in this section, is adjacent to Cedar Keys National Wildlife Refuge. This refuge boasts one of the largest nesting colonies of herons, egrets, brown pelicans, and other waterbirds in the South, with up to 200,000 nesting birds. Atsena Otie Key, which is completely undeveloped, also supports populations of these and other birds. Pepperfish Keys (P26) are also completely undeveloped and adjacent to a wildlife management area. Many of the birds found in the refuge, including shorebirds, herons, and egrets, are found on these islands as well. The Ochlockonee Complex (27A) is noted as a breeding area for bald eagles and as an occasional stopping point for migratory peregrine falcons. A large population of redhead ducks winter in the region.

Fishery resources associated with the coastal barriers include oysters, blue and stone crab, pink, brown, and white shrimp, several drum species, and sport fish such as mackerel, snapper, and bluefish.

Apalachicola Cuspate Delta. Two relatively large CBRS units now exist in this section. These are Dog Island (P28) and Cape San Blas (P30). Dog Island, is used by a variety of birds. These include great blue and little blue herons, brown pelicans, and the Cuban snowy plover. Alligators are present, and the beaches are nesting grounds for loggerhead sea turtles. Cape San Blas is a relatively large sand spit to the west of the Apalachicola River. About half of the spit is included in the CBRS. Bald eagles and migratory peregrine falcons frequent this area as do piping plovers, black skimmers, the magnificent frigatebird, and royal, sandwich, caspian, and least terns. Apalachicola barriers are important for many transgulf migratory birds as staging (scattering) areas in the fall and as first-landfall rest stops in the spring.

The aquatic resources present are, to a large degree, influenced by the Apalachicola River, the largest Florida river system emptying into the Gulf of Mexico. This river system is one of the most productive estuaries on Florida's west coast and is protected by the coastal barriers associated with it. Estuarine dependent species present include pink, brown, and white shrimp, scallops, drum, spotted seatrout, and menhaden. This estuary is the primary spawning area of blue crab in west Florida and provides over 90% of Florida's oyster production. Most of the gulf's remaining striped bass and a large portion of the remaining sturgeon populations occur in the Apalachicola area.

North-central gulf coast. Although the extent of marsh and other wetlands in this coastal section is small compared to the extensive marsh areas of adjacent Louisiana and Florida, significant fish and wildlife resources are

present. Birds remain the most conspicuous fauna, and a number of familiar coastal species are present. These include nesting black skimmers, American oystercatchers, snowy plovers, reddish egrets, and great blue herons. Less common bald eagles, brown pelicans, and peregrine falcons are also present. In addition, six species of tern nest on various CBRS units within this section. Waterfowl winter in the lower Mobile estuary.

Up to a dozen species of mammals can be found along this section of the gulf coast, including river otters, nutria, whitetailed deer, red fox, and beach mice. Beach mice are closely related to noncoastal mice but they have adapted to a life within the narrow zone of dune habitat along coastal barriers and beaches. The range of these animals has been reduced by habitat loss and alteration and they are endangered.

Nearshore and estuarine waters provide habitat for over a dozen fisheries of commercial and recreational importance. These include pink, brown, and white shrimp, blue crab, spotted seatrout, and flounder. The numerous estuaries serve as important nursery grounds for estuarine-dependent fish. Furthermore, the anadromous Atlantic sturgeon and Alabama shad pass through these waters on their upstream and downstream spawning migrations.

Mississippi Delta. This section is greatly influenced by the presence of the Mississippi River. Discharge from the Mississippi not only contributes to the shape of the coast by providing sediment for the development of marshes and barrier islands, but is also an important source of nutrients that contribute to the high biological productivity in nearshore waters.

Twelve different CBRS units exist in this section. Four are in the Mississippi Sound to the northeast of the Mississippi River Delta. These include Round Island (R01), Deer Island (R02), and Cat Island (R03). The birds associated with these barrier islands include ospreys at Round Island, wintering peregrine falcons at Cat and Deer Islands, and nesting bald eagles at Cat Island. Deer Island is also an excellent habitat for transient songbirds, including flycatchers, vireos, and warblers. Cat Island has a resident population of whitetailed deer. Fishery and shellfishery resources of the Mississippi Sound area include estuarine-dependent species such as white and brown shrimp, blue crab, oysters, and menhaden.

The eight remaining CBRS units in this coastal section are located west and north of the Mississippi Delta and are associated with the vast coastal marshes of Louisiana. Landward of these barriers is the largest marsh area in the United States. These marshes cover thousands of acres and support not only a tremendous variety of migratory and resident birds and other wildlife, but also one of the most productive fisheries in the world. The loss of these barriers would subject these marshes to the direct erosional forces of the Gulf of Mexico.

The fish and wildlife of Louisiana's coastal barriers and their associated habitats are profuse. More than 25 species of herons, gulls, and terns nest by the thousands along the barriers and nearby wetlands in this coastal section, with several important colonies located on Timbalier Island (S05) and

the Isles Dernieres (S06). In addition, more than 150 species of migratory and resident shorebirds, songbirds, and waterfowl are abundant in mudflat, coastal dune, and wetland habitats in this coastal section at various times during the year.

The marshes of the Mississippi Delta section also support a number of commercially and recreationally important wildlife. For instance, they are one of the most important waterfowl wintering areas in the United States, providing food and protection for millions of ducks and geese annually. Important geese include snow and Canada geese, while the most common ducks are pintails, teal, mallards, and gadwalls. Muskrat and nutria are the most abundant furbearing mammals in this coastal section; they support a multimillion dollar furtrapping industry in which Louisiana has led the Nation for many years. Other furbearers present along the coast include river otter, raccoon, opossum, mink, red and gray fox, and bobcat, all of which may occur within the designated CBRS units in this section. Alligators are found in wetland areas from North Carolina to Texas but are most common in the coastal marshes of Louisiana. In 1987, a controlled harvest in Louisiana resulted in the taking of 23,500 alligators, worth about $9.08 million.

The Mississippi Delta section leads the Nation in volume of commercial fishery landings; gulf menhaden and brown and white shrimp are the major fisheries although more than 100 species of fish and shellfish use these coastal waters. One quarter of the Nation's total annual catch is landed in Louisiana; in 1987, it had a dockside value of $337 million (National Marine Fisheries Service, pers. comm.). The seagrass beds, numerous estuaries, and vast tidal marshes, especially immediately around the Mississippi River Delta from Chandeleur Sound to Atchafalaya Bay, provide prime nursery grounds for shrimp, blue crab, oysters, spotted seatrout, menhaden, and other fish and shellfish.

Strandplain-chenier plain system. This coastline contains extensive brackish and freshwater marshes often partitioned by stranded beach ridges or cheniers. Over one hundred species of birds are found here, with at least 18 species of waterfowl using marsh areas either on or adjacent to coastal barriers. The lesser snow goose is the most prominent goose in the Chenier Plain, while the gadwall, at peak times, is the most abundant duck species. Bolivar Peninsula (T03A) is home to a number of other birds including least terns, great blue herons, roseate spoonbills, and American avocets. Less common species present in this coastal section include bald eagles, brown pelicans, and occasionally, migratory peregrine falcons. In addition, many migrating songbirds crossing the Gulf of Mexico use coastal hardwood areas along the crests of chenier ridges. Mammals present in this coastal section include whitetailed deer, and furbearers such as mink, river otter, raccoon, nutria, and muskrat. The strandplain-chenier plain system is at the western edge of the Mississippi Delta and yields large numbers of finfish and shellfish, especially brown and white shrimp and menhaden. Other major recreational and commercial estuarine-dependent fisheries, among over 150 species present, include blue crab, spotted seatrout, drum, croaker, spot, sheepshead, and flounder. The cheniers along the coast of this section limit saltwater intrusion into the marshes. As a result, the coastal marshes of the section are generally of low salinity and serve as important nursery areas for several freshwater species.

Texas barrier island system. Texas has more species of birds than any other State. Of the 540 species found in Texas, 380 have been recorded in the coastal zone where large numbers of migratory waterfowl and over 30 species of fish-eating birds and shorebirds are the most prominent. Practically all the diving ducks that migrate to Texas, including one-half million redheads, winter on the coast. In addition, one-half million snow and blue geese winter in the Texas lagoons and marshes as do 50,000-100,000 white-fronted and Canada geese. Migratory songbirds use trees along the edge of the Gulf of Mexico before moving south to Central and South America in autumn, and north to Canada and the upper United States in spring. Other important birds occurring here are brown pelicans, ospreys, bald eagles, whooping cranes, and peregrine falcons.

The Texas coast, in particular the extensive tidal mudflats on the landward side of the barrier islands, is an important staging area for migratory peregrine falcons. During fall and spring migration, peregrines appear to be more abundant along the Texas coast than anywhere else in the United States. The reason for this is not completely understood, but is related to the abundance of food supply--shorebirds, ducks, etc.--and to the wide open, uninhabited spaces that make catching prey easy.

Alligators are present along much of the northern Texas coast in the marshes associated with coastal barriers. Another reptile present is the Kemp's Ridley sea turtle, the only sea turtle known to have nested along the Texas coast in the recent past and one of the rarest sea turtles in the world. Efforts have been made to reestablish colonies on the Texas coast.

Rodents, including rice and cotton rats, squirrels, and rabbits, are the primary mammals found in the barrier habitats of Texas. Other species present in upland and marsh areas are raccoon, nutria, muskrat, whitetailed deer, and predators such as red fox, bobcat, and coyote.

Fisheries along the Texas coast are very important commercially and recreationally. The estuaries and their associated grass beds and marshes act as nursery grounds and adult feeding and harvesting areas for such estuarine-dependent species as brown and white shrimp. The coastal waters throughout this section have some of the highest commercial yields of brown and white shrimp in the entire Gulf of Mexico. Other estuarine-dependent species include blue crab, spotted seatrout, drum, croaker, kingfish, and mullet. The nursery areas generally are confined to the bay shallows, seagrass beds, and surrounding marshes.

Tidal passes, as in Louisiana and other areas, serve as major migratory routes for the movement of estuarine-dependent species to and from estuarine nursery grounds. Adult fish tend to concentrate around oyster reefs and artificial structures such as oil rigs in the deeper portions of the estuaries and, with the exception of snapper and grouper, most fishing in this section occurs in the estuaries.

Summary. The coastal barrier ecosystems from Maine to Texas are highly varied, but all directly or indirectly support a tremendous variety of fish and wildlife, many of which are economically important and found nowhere else.

Although the species associated with coastal barriers may change with latitude, the ecological significance of the barrier and its associated habitats remains high. Species dependent upon quiet lagoons, isolated beaches, shallow surf, and protected marshes flourish on coastal barriers. And, although a barrier along coastal Maine may be quite different from a barrier along coastal Texas, both protect landward areas from the erosional forces of the ocean, and both provide habitat for coastal fish and wildlife.

The Value of Coastal Barriers and Associated Aquatic Habitats

The CBRA defines coastal barriers to include "all associated aquatic habitats, including adjacent wetlands, marshes, estuaries, inlets and nearshore waters." As will be discussed in the following chapters, the recommended revised delineation criteria would extend "all associated aquatic habitats" to include not just the contiguous aquatic habitats immediately landward of the barrier, but all aquatic habitats between the barrier and the mainland. The recommended expansion would be limited to a maximum of 5 mi of continuous wetland or 1 mi of open water landward of the mean high water line on the seaward margin of the coastal barrier.

Section 2(b) of the CBRA states that the purpose of the Act is "to minimize the loss of human life, wasteful expenditure of Federal revenues, and the damage to fish, wildlife, and other natural resources associated with the coastal barriers along the Atlantic and Gulf coasts." Because much of the fish and wildlife traditionally associated with coastal barriers depends not only on the barrier itself, but also upon nearby aquatic areas such as marshes and estuaries for food and habitats, the inclusion of these areas in the CBRS would be consistent with the CBRA's mandate. Also, the characteristics of the coastal barrier substantially determine the characteristics of adjacent fish and wildlife habitats and other natural resources.

The purpose of this section, then, is to provide a sound basis for a broader understanding of the inherently interdependent nature of coastal barriers and their associated aquatic habitats. It will emphasize the inseparability of the barrier from its associated wetlands. This interdependent relationship is examined from three different perspectives: physical, ecological, and recreational and/or aesthetic. The value of both the barriers and their associated aquatic habitats to the coastal communities they protect, to the fish and wildlife they support, and to the millions who enjoy the public recreation they provide, has been implied in Section 2 of the CBRA. These values are also discussed in this section.

Physical relationship. The physical link between coastal barrier and wetland is, in many cases, forged during the formation of the barrier itself. Figure 12 illustrates one common way barrier beaches are formed. A sand spit grows out from the end of the shoreline, supplied with sediments from the mainland and transported by longshore littoral currents. As the spit grows, the waters behind the spit are protected from wave energy. Protection from waves is the most important function a coastal barrier provides for associated aquatic areas. By slowing water currents, barriers allow suspended mud and silt in the water to settle and accumulate. These stable, muddy sediments are quickly colonized by marsh grasses. In turn, the grasses act as a "sediment trap,"

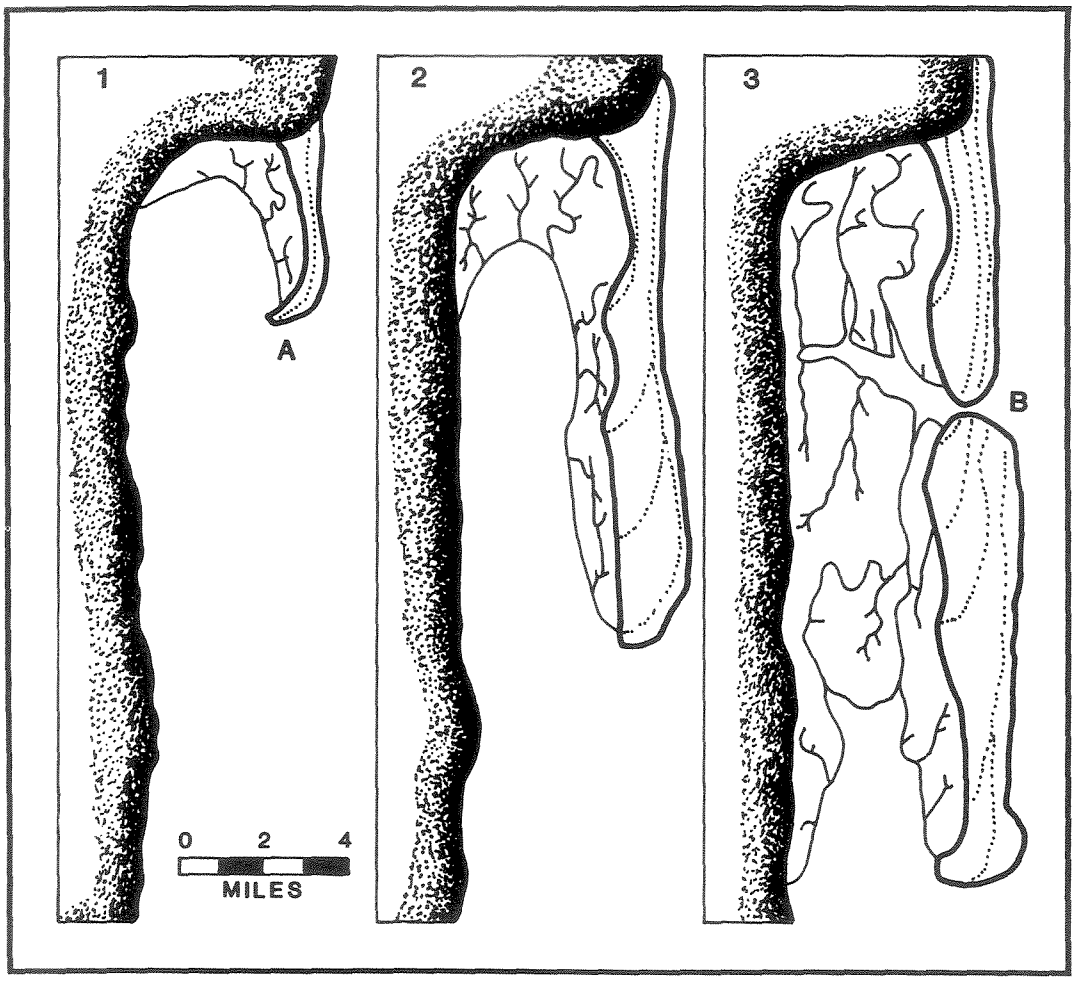


Figure 12. Barrier island formation by sand spit accretion from the mainland (A) and eventual breaching of the spit by waves and/or storm erosion at (B) to form the barrier island. Dark lines represent extent of sand deposits. Dotted line represents possible historic sand-water boundaries (adapted from Hoyt 1967).

catching more sediment from even slower moving waters, and further enhancing marsh growth. As the marsh grows, it becomes more complex as different kinds of plants and animals take advantage of the newly created habitat. Eventually, an entire community is established with hundreds of plant and animal residents. If the protective barrier spit or island is lost, these low-lying marsh communities will be exposed to the direct erosional forces of the ocean, and will be much reduced in size if not destroyed altogether.

Tides affect both barriers and wetlands. Although there is significant variability in both tidal range and frequency along the U.S. coast, in all regions tides serve the vital function of flushing marsh areas and providing nutrients. The presence of a coastal barrier influences the pathway of the tidal currents and therefore influences the distribution of fresh, brackish, and salt marsh habitat.

Perhaps the most significant benefit the public realizes from coastal barriers is the mitigating effect they have on wind and waves generated at sea. Like the marshes, heavily populated or developed areas landward of a barrier system are protected from waves and erosion. This buffering capacity is especially critical during times when storms and hurricanes could cause inestimable damage to buildings and property without the protection coastal barriers provide. Artificial protection against oceanic storms has had only limited success compared to these naturally resilient and durable landforms.

Ecological relationship. Aquatic habitats associated with coastal barriers are firmly coupled to their surrounding ecosystems. Water, nutrients, and sediments are freely exchanged between rivers, coastal estuaries, bays, and the ocean. Much of the fish and wildlife found in wetlands use neighboring habitats as well. These ecological linkages between aquatic areas and coastal barriers are extremely important to the functioning of the entire coastal biosphere.

Ecologists have noticed that there is very often an increase in the variety and density of animal species found in the transition zone between two habitat types. This is commonly termed the "edge effect," and it is especially apparent in coastal marshes and estuaries. Often these habitats contain a density of animals that is found nowhere else.

The most obvious "edge" along a coast is that between the water and the land. Although the marsh itself can be considered a transition zone between land and water, within the marsh there is another, more subtle "edge," between salt and fresh water. Numerous species of fish and shellfish inhabit estuarine areas where the water is a mixture of fresh and saltwater. In fact, more than two-thirds of the major U.S. commercial fish and shellfish depend on these areas during some stage of their life cycles. One advantage to species using estuarine marshes for spawning or nurseries is that both truly marine and truly freshwater predators are excluded. Another important benefit is the abundance of available food such as organic detritus, plankton, and small mud-dwelling invertebrates. Where extensive marsh and estuarine areas are present, the productivity of coastal fisheries is often increased (Turner 1977). In fact, recent studies have demonstrated a direct correlation between coastal marsh and fisheries production. The National Marine Fisheries Service

has estimated that estuarine marsh losses between the years 1954 and 1978 cost about $208 million in annual fisheries losses. Without the presence of an intact coastal barrier system these losses could have been much greater.

The inlets between coastal barriers connect nearshore waters with marshes and estuaries. A great variety of fish and shellfish pass through these inlets in various stages of their life cycles. The inlets control the exchange of water between marshes and the ocean, limit wave energy reaching marsh areas, and focus fisheries movement. Such passes are often important commercial fishery locations.

A different kind of use is exhibited by a number of bird species that move daily in and out of marshes to feed. Wading birds, for example, often nest on adjacent coastal barrier and upland habitat, but feed in the marshes and marsh ponds during the day. Gulls, terns, skimmers, pelicans, and many other birds also rely upon barriers for nesting habitat, while feeding in nearby marshes and estuaries. Thus, like some fish species, certain birds display a preference for transition areas. In this case, the "edge" is between uplands or coastal barriers and the marsh. The mobility of birds gives them the ability to exploit both habitats.

Mammals that use coastal barrier and wetland habitats, being less mobile than birds, are most common directly along the "edge" between the two. Differences in mammal communities between CBRS units typically result from the differences in vegetation. For example, a barrier that consists entirely of dunes and grasses will not support the same fauna as a barrier that contains a well established maritime forest. In addition, barriers connected to the mainland (bay barriers and spits) are more likely to be exploited by mammals on a daily or seasonal basis than barrier islands.

Those mammals that depend to some degree on both fastland (nonwetland) and marsh include foragers such as deer, rabbits, and mice; predators such as foxes, bobcats, and coyotes; and omnivores such as opossums, skunks, and raccoons. Local populations of these animals have, in some cases, undergone evolutionary and behavorial adaptations in order to exploit available food resources and survive in such a dynamic environment.

Thus, the presence of a coastal barrier in association with coastal wetlands can have an important influence on the diversity of wildlife by creating a marsh/upland interface for those animals that prefer this transition area. Coastal barriers have a less direct influence on the fish and shellfish using coastal marshes, but the presence of a coastal barrier, as discussed earlier, is often responsible for creating and maintaining the vast acres of highly productive wetlands and estuaries that are habitat for these fish and shellfish. Along the Gulf of Mexico and Atlantic coasts these barrier-dependent coastal wetlands nurture stocks of finfish and shellfish vital to commercial and recreational fisheries. Furthermore, coastal barriers provide habitat for over 20 federally listed endangered or threatened species. These include birds such as the bald eagle, peregrine falcon, whooping crane, and brown pelican; mammals such as manatees and beach mice; and reptiles such as sea turtles and the American alligator. Finally, large populations of migratory

waterfowl and shorebirds depend on coastal barriers and their associated wetlands for food and protection during spring and fall migrations.

Coastal barriers and their associated wetlands are one "biosphere," consisting of a series of neighboring, interacting ecosystems. Physical, chemical, and biological processes are all involved in linking these ecosystems together. It is imperative that the entire biosphere be considered as a unit because it functions as a unit. Human alteration in one part of the unit can often affect the equilibrium of the entire system. While these effects may not be readily apparent, they nevertheless occur. In order to perpetuate the ecological values of coastal ecosystems, we must understand and appreciate this functional relationship.

Recreational and aesthetic relationship. For the many people who use the coastal zone for boating, fishing, sunbathing, or just a relaxing walk, the association between barrier and aquatic areas is an important part of the scenic and recreational quality of the coast. Much of the recreational activity in coastal areas is nonconsumptive, involving aesthetic or intrinsic values--values which are difficult to measure. For this reason the justification for protecting wetlands and other environmentally sensitive areas from development has often focused on the importance of the "ecological services" or resource values that wetlands provide, which are more scientifically and economically demonstrable than intrinsic qualities. Intrinsic values are nonetheless very important. For example, a 1985 National Survey conducted by the FWS showed that 109.7 million, or over half of all adult Americans, actively participated in nonconsumptive, wildlife-related activities such as feeding, observing, or photographing wildlife. These statistics give some indication of the relative importance Americans place upon their environment.

Various studies have found that coastal wetlands rank high in aesthetic quality in comparison to other landscapes. One particular value of wetlands is the attraction of the land-water interface. It seems that people, as well as fish and wildlife, find the edge between land and sea to be especially appealing. The numerous birds and other wildlife present undoubtably provide some of that appeal.

Recreational activities in coastal areas include fishing, camping, boating, and hunting. Hunting is focused primarily on the waterfowl that make extensive use of coastal marshes for food and protection during migration. In Louisiana alone, where a large percentage of North America's waterfowl winter, 115,000 hunters enter the coastal marshes each year. In 1979, nearly 10 million sport fishermen traveled to the Atlantic and Gulf of Mexico coasts to catch over 20 million fish. A large majority of these fish are estuarine dependent during some stage of their life cycle.

With the exception of certain recreational beaches on Cape Cod, Massachusetts, all nine Atlantic Ocean and Gulf of Mexico coastal units of the National Park System are located on coastal barriers and spits. These areas supported 30 million visits in 1984. In addition, 19 of the 25 most visited National Wildlife Refuges have substantial wetland components and a number of these

refuges are located along the Atlantic and gulf coastlines. These statistics are an indication of the heavy use coastal areas receive.

There are many reasons why people value an environment that has remained essentially untouched by human presence. Whether it is the love of wilderness or simply the enjoyment of peaceful solitude, the reasons defy expression in quantitative or economic terms and are therefore often overlooked in a society where decisions are frequently based upon cost-benefit analyses. The reassurance that these areas will exist for both present and future generations, regardless of quantifiable values, can be a strong motivation in itself to preserve coastal barriers and wetlands in their undisturbed state.

Human Impacts on Coastal Barriers

Undeveloped coastal barriers have high ecological, recreational, and commercial values. Developers, industry, and the public compete intensely for the use of their resources, and the inevitable conflicts threaten to seriously degrade coastal barrier environments both as ecosystems and as sites for potential human development and activity. In its undisturbed state, the coastal barrier system is highly resilient, but despite this capacity to adjust, the system can be easily damaged by human activity. This section will review how human activities can directly or indirectly disrupt the natural processes that maintain the physical and ecological well being of the CBRS.

As was discussed in the previous chapter, the general characteristics of coastal barriers are shaped by (1) the energy regime, including wind, waves, storms, and tides, (2) the dynamic equilibrium of sediment deposition and erosion, (3) world-wide sea-level fluctuations, and (4) subsidence of the continental margin. The interaction of these processes influences both the shape and location of coastal barriers. Evidence of these processes may be observed in the daily, seasonal, and storm alteration of coastal barrier profiles, in the landward migration of barrier features, in the shifting formation and migration of coastal sand dunes and inlets, and in the loss of coastal wetlands. When allowed to function naturally, these processes ensure the continued maintenance of the coastal barrier system. When people alter these coastal processes, however, they reduce the system's ability to adjust to environmental forces, which in turn can lead to the destruction of the human-made structures located on the barrier, the wildlife using the barrier, and the coastal barrier itself (Brower et al. 1976).

The human activities that threaten to disrupt coastal barrier processes can be grouped into three major categories:

1. Construction and development

   Since 1950, development on Atlantic and gulf coastal barriers has increased from about 10% of the available real estate (about 250 mi of coastal barrier shoreline) to about 40% today (about 1,050 mi). In 1980, it was estimated that about one-third of the developable land acreage of these coastal barriers had been developed (U.S. Department of the Interior 1983). That percentage is probably greater today.

2. Shoreline protection and stabilization

   The U.S. Army Corps of Engineers estimates that 44% of the total Atlantic Ocean and Gulf of Mexico shoreline is experiencing significant beach and dune erosion.

3. Construction and maintenance of navigation channels

   For the period 1945-55 through 1972-75 the rate of loss of wetlands due to dredging and maintaining channels is estimated at about 3,100 acres per year. While current rates are probably lower, they are still significant (U.S. Department of the Interior 1983).

Examples of each activity are discussed below in terms of their potential impacts on the component environments of the coastal barrier system.

The beach. The beach is shaped by the repetitive onshore movement of waves, by longshore currents generated when waves hit the beach at an angle, and by sea-level rise. These three processes insure that the various grades and sizes of sediment that compose the beach are in constant movement. The shape and location of the barrier beach are directly related to the direction and intensity of water movement. The beach is inherently a dynamic system and any attempts to make it "stable" by altering water flow or sand supply are sometimes self-defeating. Sometimes beach stabilization efforts work over the short term, but over the long term, attempts to save a beach through stabilization may end up destroying it (Brower et al. 1976). However, if the shore in its natural state was not eroding, efforts to stabilize would not be undertaken.

The erection of groins, seawalls, bulkheads, and other engineering devices designed to impede natural oceanic currents and sand transport are good illustrations of this dilemma. They are constructed in order to protect beachfront development located in unstable coastal areas. As the shoreline retreats or changes shape, owners of beach property often request publicly funded beach restoration projects to protect their private holdings. If stabilization measures are taken, they can begin a cycle of erosion and temporary engineering solutions that often becomes more and more expensive.

Groins, built perpendicular to the beach, work by interrupting the littoral drift of sediment. The groin traps sediment on the updrift side, building the beach, but accelerates erosion on the downdrift side. The sand that is trapped by the groin is no longer available to nourish downdrift beaches. Once one groin is installed, then a whole series of groins may be required to stabilize the beach from inlet to inlet.

Seawalls, rigid structures built parallel to the shore, may lead to the destruction of the beach in front of the wall. Waves cannot expend their energy running up the beach, but instead are reflected back to sea, carrying the beach sand with them. If the seawall is undermined, it will fall and the ocean will rush in over the barrier.

Inlets. Inlets link the ocean, coastal sounds, and back-bay areas. Inlets are shaped not only by longshore currents, sea-level rise, and normal wave action, but also by daily tidal currents. The interaction of longshore and tidal currents often results in broad, continually varying fans of sand deposition on both the landward and ocean side of an inlet. As discussed earlier, the inlet serves as a migratory route for marine species. It allows in sediments that form the physical substrate for the marshes and enables salt and freshwater to mix to form the estuarine-sound environment.

Dredging, jetties, sand-bypass systems, and other artificial stabilization strategies are used to maintain navigation channels through inlets and protect commercial and recreational development. Tampering with inlet dynamics, however, can endanger the natural deposition of sand, the migratory patterns of marine species, the self-maintenance of barrier features, and the very existence of the marsh.

Dunes. Sand dunes are a major storage center for beach sediments and play a vital role in absorbing high winds and waves during storms. Natural dunes constantly shift position in response to wind and water. Where the shoreline is retreating landward, natural dunes migrate inland as well.

Leveling or relocating primary dunes reduces the barrier's resiliency to oceanic forces. When dunes are leveled, structures are directly exposed to storm waves. Building structures on dunes or within the natural migration path of the dune not only eliminates the dune's responsiveness to storms but also exposes buildings and property to unnecessary hazards such as burial. Vehicular or foot traffic on dunes can kill stabilizing dune vegetation. Where dunes are broken, sand blows back into the shrub zone and maritime forest, burying and killing the plants. Threatened or endangered sea turtles, least terns, and piping plovers require isolated fore dune or high beach habitat for nesting. Dune loss and dune occupation and disturbance by people are severe threats to their continued survival. Finally, introduction of exotic plants to artifically stabilize and build dunes can instead thwart their migration and reduce their ability to absorb storm surge. Examples are Hatteras, Pea, and Bodie Islands (North Carolina) where extensive dune building and dune stabilization efforts have resulted in serious erosion of the beaches on both sides of the islands.

Maritime shrub and forest vegetation. Maritime shrubs and forests sometimes develop on the widest portions of coastal barriers. They are different from their inland counterparts because of adaptations they have had to make to the high winds, salt spray, and sandy soils characteristic of the coastal environment. Because maritime forests are located on the most stable sections of coastal barriers, they are often under intense development pressures. Extensive development in maritime forests means large numbers of trees and shrubs are cut, which reduces the sand and water holding capacity of the area. Without the protective "wind screen" of forest vegetation, relic dunes may become active again and migrate over remaining vegetation or newly located human structures. Demand for freshwater in the forest is usually greater than the rate of replenishment, which lowers the water table and allows saltwater intrusion into wells. Septic drainage in porous, saturated soils often means

waste discharge pollutes the water supply. This is particularly common on coastal barriers far from water supplies on the mainland.

Aquifers. An aquifer is a naturally occurring mass of water-retaining rock, sand, or gravel. On coastal barriers, aquifers are shallow, lens-shaped bodies of freshwater floating on saltwater that has intruded into deeper sediments. The extent of the freshwater table varies considerably, with greatest supplies found in maritime forests and lesser pockets occurring in the dune system.

Excessive ground water extraction for public water supply lowers the water table and may kill stabilizing vegetation. Septic tank contamination of ground water in overly dense developments is a particular problem because coastal barrier sediments are mostly highly porous sands. Finally, the destruction of vegetation and construction of impervious surfaces such as pavement can significantly retard the recharge of the water table.

Wetlands. Wetlands include the wide variety of marshes, swamps, and bogs associated with and protected by coastal barriers. Each year almost half a million acres of our Nation's wetlands are lost. Wetlands are lost when they are permanently converted to open water or dry land. Wetlands can also be converted from one form to another, for example, from freshwater to saltwater marsh. This can have serious consequences for wildlife.

While natural forces do act in a variety of ways to modify wetlands, human activities play a much greater role in determining their fate. Many human activities either directly destroy wetlands or reduce their quality. Drainage for crop or timber production or mosquito control changes wetland to dryland. Draining accompanied by filling is often used to convert wetlands to drylands for road construction, industrial development, or residential development. Extensive dredging takes place in and around wetlands to maintain navigational channels, to provide access for oil and gas drilling and for pipelines, to control floodwater drainage, and to create and maintain marinas. Such dredging can both destroy wetlands and allow saltwater intrusion into freshwater wetlands. Saltwater intrusion destroys freshwater marshes by killing the plants. If the intrusion is gradual enough, the freshwater marsh may become a salt marsh, but it will no longer support the wildlife requiring freshwater.

The sediments removed while dredging (dredge spoil) can be deposited on wetlands, changing them to drylands, or spoil islands or banks can be created. These spoil banks can alter or prevent natural waterflow through wetlands. In the same way, levees, dikes, dams, and reservoirs prevent water from reaching wetlands. Subsidence (sinking) is the natural fate of coastal wetlands as sediments are compacted and sink under open water. Sediments carried downstream and into wetlands by riverflow and floodwater flow are necessary to offset this loss and maintain coastal wetlands. Levees, dams, and reservoirs contribute to subsidence by preventing sediment-laden waters from reaching wetlands. Dams on the Ohio, Missouri, Tennessee, and other rivers have reduced the sediment carried by the Mississippi by half. The levees on the Mississippi prevent natural flooding and cause the river's still substantial sediment load to be flushed directly into the Gulf of Mexico.

Extraction of ground water, oil, gas, and minerals such as sulfur, salt, and phosphate can also cause subsidence. These activities caused much of the Galveston Bay area's wetland loss. Mining of wetland soils for peat, sand, phosphates, coal, and other materials also destroys wetlands. Wetlands can filter out some of the pollutants that are released into them, but pollution from urban and agricultural runoff and industrial waste frequently overloads the wetland's filtering capacity. Water quality is reduced, killing marsh plants, killing fish and shellfish or contaminating them for human consumption, and limiting wildlife abundance.

Summary. The enactment of the CBRA in 1982 was, in part, due to recognition of the impact that people have on fragile coastal barrier systems and their associated fish and wildlife resources. In order to maintain and enhance the valuable natural resources associated with coastal barriers, uncontrolled development should be prevented. Development in coastal areas may be undesirable when it intrudes into unique scenic areas, disturbs highly prized fish and wildlife habitat, and alters the natural processes that sustain the coastal barrier. Artificial stabilization projects can interfere with the ability of wind and water to transport sediments, severely affecting maintenance of the natural equilibrium between landform and ocean energies. It threatens not only the existence of the barrier and its assemblage of natural resources, but also the protected areas which would be exposed to the open sea if the barrier were lost, potentially upsetting the ecological balance of an entire region. For example, the coast of Louisiana already suffers from wetland losses of about 50 mi^2 annually because of saltwater intrusion, subsidence, and intensive canal dredging. Should a barrier island, such as Grand Terre or Timbalier, disappear due to some combination of canal dredging and storm damage, thousands of acres of adjacent marsh would be exposed to the erosional forces of the ocean. These marshes are among the most productive in the world, and their loss would have a significant impact on the fish and wildlife of Louisiana and the entire northern Gulf of Mexico.

COASTAL BARRIERS ALONG PUERTO RICO AND THE U.S. VIRGIN ISLANDS

The Ecosystems

Coastal ecosystems in Puerto Rico and the U.S. Virgin Islands include coral reefs, beaches, seagrass beds, mangroves, and salt ponds (Figures 13, 14).

Mangroves. Mangroves are productive ecosystems which support a high diversity of fish, birds, and other wildlife. The mangrove food web, based largely on the release of nutrients from the decomposition of mangrove leaves, supports nearshore fisheries. Mangroves are vital feeding, nesting, and roosting areas for several species of birds including ospreys, pelicans, egrets, herons, and ducks. Many of the species are rarely seen outside this habitat.

Red mangroves (*Rhizophora mangle*) grow along the shoreline, often in monospecific stands. In well-developed forests, red mangroves form the seawardmost zone, and black (*Avicennia germinans*) and white (*Laguncularia racemosa*) mangroves grow behind the red mangroves. Off the south coast of Puerto Rico there are mangrove islands (cays) with red mangroves nearshore and

Sand Beach - Grass Beds - Salt Pond - Reef Associations

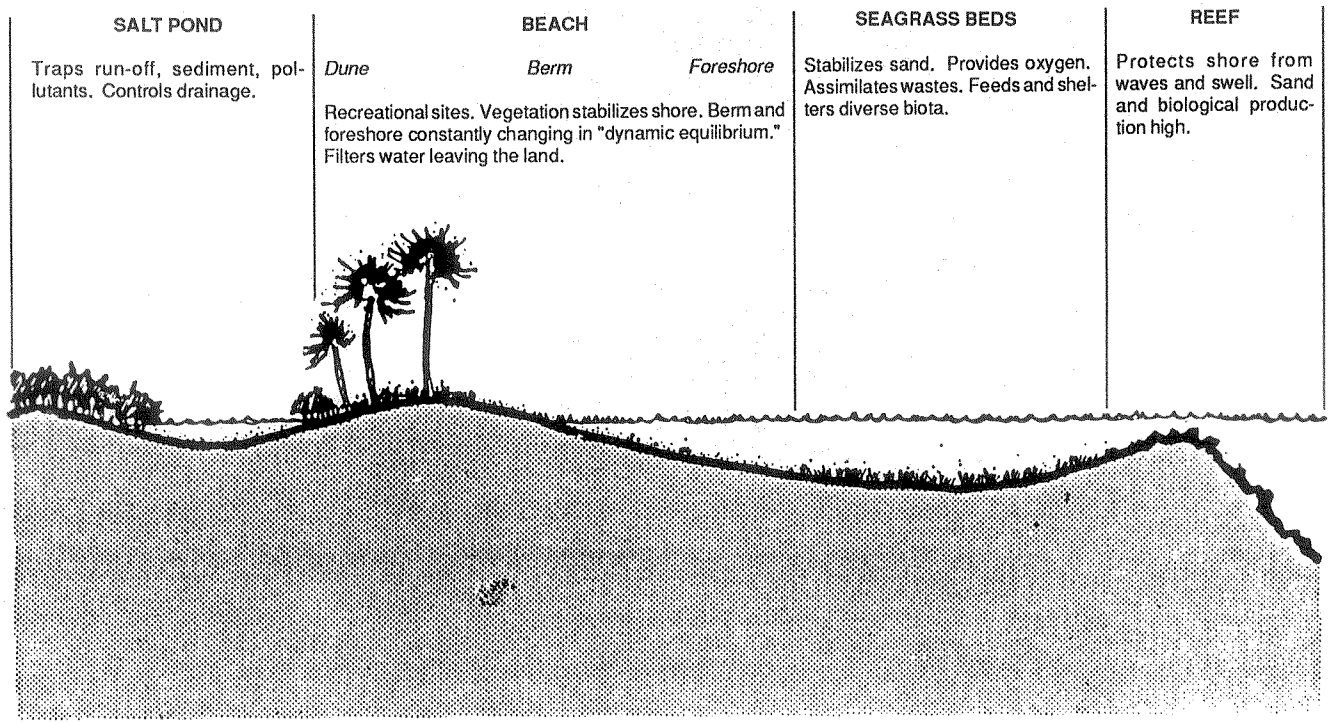


Figure 13. Typical sand beach ecosystem showing relationship of component habitats.

Mangrove - Lagoon - Reef Associations

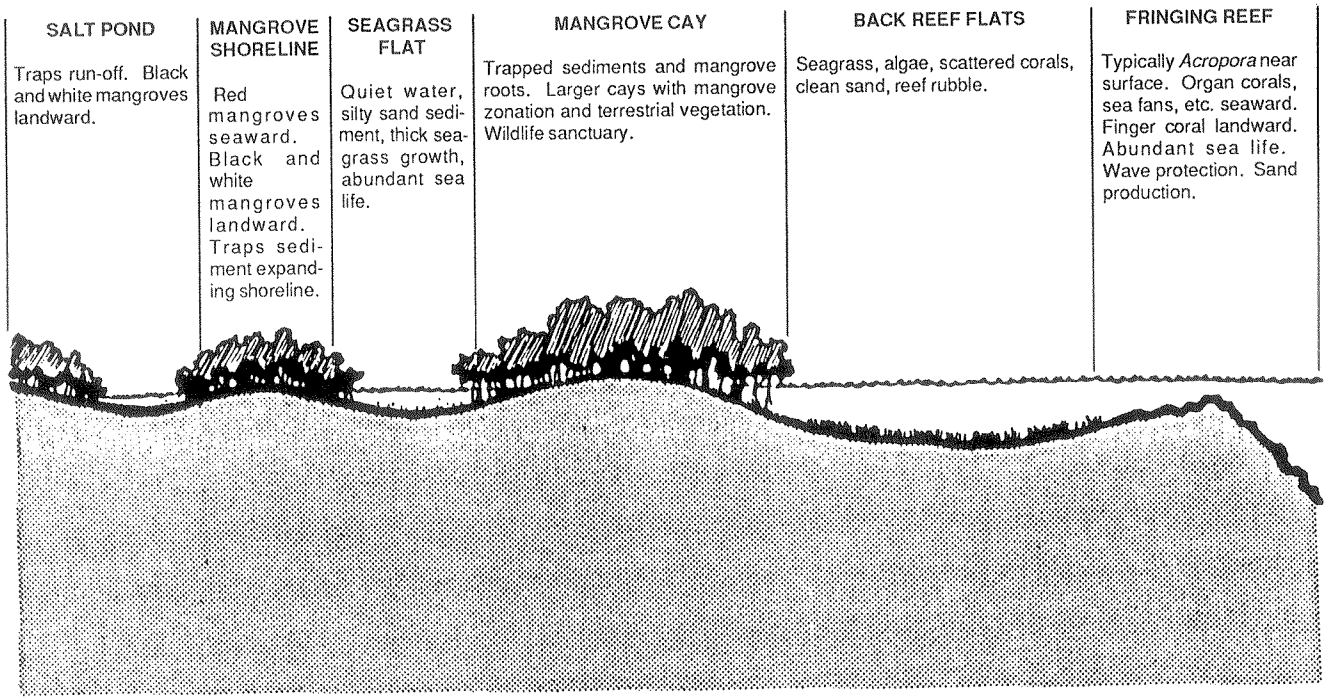


Figure 14. Mangrove dominated ecosystem with lagoonal flats and protective reef. The food chain is centered on seagrasses and mangrove litter.

black mangroves in the interior. Often a highly saline pond towards the cay's center will contain black mangroves which died when the salinity exceeded the tolerance of even this salt-resistant species. In places where channels to the sea exist, or where the berm is low enough that storm seas can break through to the inner forest, the salinity stays low enough that black and white mangroves thrive.

The red mangroves are the most distinctive of the three major tree species because of their aerial prop roots. These roots are usually partially submerged and support a diverse community of sponges, ascidians, algae, and sometimes even corals. Juvenile reef and pelagic fishes as well as lobsters are abundant in these root communities. The roots also trap sediments and over a period of several years can extend the shoreline seaward. Mangroves can reduce the amount of runoff (and associated sewage and pollutants) which reaches offshore seagrass beds and coral reefs.

Salt ponds. Most salt ponds are formed when mangroves or fringing coral reefs grow across a portion of a bay, isolating that portion from the waters in the rest of the bay. Coral rubble and sand transported by storm waves can contribute to the closing off of a pond. Beaches and salt ponds commonly occur together, and black and white mangroves frequently fringe the edges of the pond.

These ecosystems support a specialized biota that varies with fluctuations in the salinity of the pond water. Several species of insect-eating and fish-eating birds, including kingfishers, herons, ospreys, stilts, and sandpipers, feed on the insects, brine shrimp, and fishes in the ponds.

Rapid evaporation causes the water to be extremely saline, and salt crystals sometimes form along the shores of the pond. The most saline ponds will support a less diverse fauna than those ponds where storm waves have breached the berm, creating channels where seawater of normal salinity rushes in, reducing the salinity. Barracudas, mullets, and crabs can be found in ponds which are open to the sea.

Many salt ponds situated between an upland watershed and its associated bay function as settling or catchment basins, trapping the runoff from the land. Especially in areas where development of the watershed has occurred, the ponds reduce the amount of silt-laden water which reaches the bay, contributing to maintenance of high water quality in the bay.

Seagrass beds. Seagrass beds are highly productive ecosystems that are extensive in the shallow waters around Puerto Rico and the Virgin Islands. In the Caribbean, turtle grass (Thalassia testudinum) and manatee grass (Syringodium filiforme) are the most abundant seagrass species. Calcareous algae such as Halimeda and Penicillus, which have calcium carbonate or limestone in their tissues, grow in the grass beds. Most beach sands are primarily composed of particles which arose from the decomposition and disintegration of these calcareous plants. The extensive root system of seagrasses helps to stabilize the sediments and reduce erosion.

Several species of commercially important fishes, such as snappers and grunts, find shelter in coral reefs during the day and feed in the grass beds at

night. Grass beds support populations of the endangered green sea turtle (Chelonia mydas) and the West Indian manatee (Trichechus manatus); they are also the primary habitat for the commercially important queen conch (Strombas gigas), which feeds on the algae growing on the grass blades. The food web in grass beds is based both on direct herbivory (grazing) on grass blades and algae, and on the detritus produced by the decomposition of these plants. Conspicuous halos or bare sandy zones around coral patch reefs within grass beds are the product of physical factors like currents and of grazing by fishes and sea urchins. Dredging and boat anchors and propellers leave scars in grass beds which can take years to recover.

Coral reefs. Coral reefs are the most productive and diverse of all marine ecosystems. They have economic value for recreation and tourism, and provide vital protection for harbors and shorelines because they dissipate wave energies and reduce erosion. The reef system is complex. The numerous holes and crevices in the reef's limestone structure provides shelter for fishes and crustaceans. Harvestable coral reef resources include fish, spiny lobsters, octopuses, and conchs. Commercially important fishes associated with reefs include snappers, groupers, triggerfish, and grunts. Endangered hawksbill sea turtles live on the reefs. Breakdown of hard coral skeletons produces sand for beaches.

Beaches. The beautiful beaches in Puerto Rico and the Virgin Islands are major tourist attractions. Particularly in Puerto Rico, however, their sands have been mined extensively for construction. Reefs and seagrass beds help to buffer wave energies and reduce shoreline erosion, resulting in deposition of sand and formation of beaches. The protection provided by these ecosystems results in less severe erosion than that observed along the Atlantic coast of the United States.

Fish and Wildlife Values

Examples of the major coastal ecosystems--beaches, mangroves, seagrass beds, and coral reefs--exist in both Puerto Rico and the Virgin Islands. Differences among the islands, and between one section of an island and another, depend primarily on differences in the location of these ecosystems, their size, and stage of development.

Mangroves, for example, are best developed in Puerto Rico, where, unlike the Virgin Islands, there are major rivers and streams. There is a higher diversity and abundance of animal species associated with the mangroves in Puerto Rico than in the Virgin Islands. The Virgin Islands, however, have the most extensive coral reef development. The largest reef exists as a barrier along the southern coast of St. Croix where the submarine shelf is especially wide and shallow. Reefs around St. Thomas and St. John are smaller, fringing reefs.

Puerto Rico is a large island, with an area of 3,435 mi^2 compared to the combined area of 133 mi^2 for the Virgin Islands. It has a greater diversity of habitats, thus it is not surprising that more endangered and threatened species occur in Puerto Rico (Table 4). The West Indian manatee is found near

Table 4. U.S. Fish and Wildlife Service's National species of special emphasis and endangered and threatened species and their occurrence within the coastal barriers of Puerto Rico and the U.S.V.I. E = on Federal endangered species list; T = on Federal threatened species list; LE, LT = considered locally endangered or locally threatened (Philobsian and Yntema 1977; Norton 1983; Puerto Rico Department of Natural Resources 1984; Slayden, pers. comm.).

Species	Puerto Rico	St. Thomas	St. John	St. Croix	Status
Birds					
Least grebe	x	x	x		LE
Red-billed tropicbird	x	x	x		LE
White-tailed tropicbird	x	x	x	x	LE
Brown pelican	x	x	x	x	E
Blue-faced booby	x	x			
Red-footed booby	x	x			LE
Magnificent frigatebird	x	x	x	x	LE
Great blue heron	x	x	x	x	LE
Great egret	x	x	x	x	LE
Snowy egret	x	x	x	x	LE
Black-crowned night-heron	x		x	x	LE
Least bittern	x				LE
Glossy ibis	x				LE
West Indian whistling duck	x				LE
Bahama duck	x	x	x	x	
American wigeon	x	x	x	x	LE
Northern pintail	x				LE
Ring-necked duck	x		x		LE
Masked duck	x				LE
Ruddy duck	x	x			LE
Osprey	x	x			LE
Peregrine falcon	x		x	x	E
Clapper rail	x	x	x	x	LE
Purple gallinule	x				LE
Caribbean coot	x	x	x	x	LE
Piping plover	x				
Snowy plover	x			x	LE
Willet	x	x	x	x	LE
Short-billed dowitcher	x	x	x	x	LT
Common tern	x	x			LT
Roseate tern	x	x	x		LE

(continued)

Table 4. (Concluded).

Species	Puerto Rico	St. Thomas	St. John	St. Croix	Status
Least tern	x	x	x	x	E
Royal tern	x	x	x	x	LT
Sandwich tern	x				LT
White-crowned pigeon	x	x	x	x	LT
Plain pigeon	x				LE
Key West quail dove	x				LT
Bridled quail dove		x	x	x	LT
Puerto Rican parrot	x				E
Reptiles					
Green sea turtle	x	x	x	x	T
Hawksbill	x	x	x	x	E
Loggerhead	x				T
Leatherback	x	x	x	x	E
Common iguana		x	x	x	
St. Croix ground lizard				x	E
Blue-tailed ground lizard	x				
Slipperyback skink	x	x			
Puerto Rican tree boa	x				E
Tree boa	x	x			T
Ground snake	x	x			
Mammals					
Fisherman bat	x	x	x	x	
Red fruit bat	x	x	x		
Sperm whale	x	x			E
Humpback whale	x	x	x	x	E
West Indian manatee	x				E

Vieques Island (Puerto Rico) and off the shores of the main island. Leatherback turtles nest most abundantly on beaches in St. Croix and Culebra (Puerto Rico). Green turtles are commonly observed within the protected waters of Virgin Islands National Park on St. John.

Human Impacts on Caribbean Coastal Barriers

Industrialization and tourism have placed enormous demands on the coastal resources of Puerto Rico and the Virgin Islands. The population of the Virgin Islands has tripled in the last three decades to about 100,000, and Puerto Rico has over 3.2 million people. Development pressures on the coastal barriers are evident as marinas, hotels, and condominiums continue to be built.

One of the largest mangrove systems in the Virgin Islands, on the south side of St. Croix, was filled to make way for an alumina plant and for one of the largest oil refineries in the western hemisphere. Shipping channels were dredged through a coral reef to accommodate supertankers and bulk ore carrier ships. Efforts to reestablish mangroves by planting seedlings in some marginal areas have been relatively successful, but the new "forest" is only a small fraction of the one destroyed.

Clearing mangroves has altered drainage patterns in several locations, leading to increased runoff from the land entering the bays. Mangroves have historically been thought of as insect-infested swamps with few redeeming characteristics. Consequently, they have been cleared, filled, and frequently used as garbage dumps. One of the largest remaining well-developed forests in the Virgin Islands, Jersey Bay ("Mangrove Lagoon") in St. Thomas, has deteriorated significantly because of upland development. Increased turbidity from runoff, sewage treatment plant effluent, dredging, and the construction of several marinas have all contributed to the decline of the bay.

The steep slopes on these islands promote rapid runoff, and the soils do not have much moisture-holding capacity. Where watersheds have been extensively developed, the associated bays have siltation problems. Clearing upland vegetation on the steep hillsides has accelerated erosion and led to increased runoff. Coral reefs have suffered from the resulting turbidity. Sediment particles smother the reef organisms, inhibit coral recruitment and growth, and reduce the amount of light available for photosynthesis. Silt from dredging operations can continue to be resuspended for years after dredging ceases.

Several bays have been dredged for construction sand. Seagrass beds have not reestablished themselves in some of these areas. For example, the dredged areas in Lindberg Bay, St. Thomas, remain barren although dredging took place over 40 years ago. Aerial photographs over recent years indicate that seagrass beds have decreased in area in several bays. In some cases, the decrease seems to be associated with thermal-saline effluent from desalination plants. Seagrasses have also suffered from anchor and propeller damage.

Beaches have been mined for sand, particularly in Puerto Rico but also in the Virgin Islands. An estimated 2.2 million yd^3 of sand have been removed from

Christiansted Harbor, St. Croix, alone. In 1973, the Virgin Islands passed legislation to stop the mining of beaches and nearshore areas, although it has not been completely successful. Groins and other retaining structures have been built in attempts to trap sand for particular beaches, usually resulting in erosion problems in other areas.

The filling of salt ponds has destroyed their function as catchment basins for runoff. The associated aquatic habitats, important as roosting and feeding areas for a variety of birds, have been destroyed. The impacts of heavy metals, pesticides, and other chemicals associated with petrochemical complexes, shipyards, and factories on coastal areas are still being assessed. Oil spills have resulted in the death of some mangroves in Puerto Rico.

Some activities, like dredging, actually remove the physical structure of a coral reef while others, such as sewage discharge into overlying waters, can lead to the death of reef organisms but leave the physical framework unimpaired. Sewage and fertilizers stimulate the growth of marine algae which can outcompete and overgrow corals. The collection of corals, fish, and shells for souvenirs and scientific purposes has caused localized damage. Overfishing and habitat destruction have led to serious depletion of lobsters, conchs, whelks, and several species of fishes (especially the yellowtail snapper and Nassau grouper).

Coral reefs, seagrass beds, and mangroves interact in numerous ways, and one system cannot be managed in isolation from the others. Cutting mangroves, which trap sediments, causes excessive siltation of nearby seagrass beds and coral reefs from runoff after heavy rains. Runoff is especially severe where coastal development or agriculture exists. Destruction of red mangroves with submerged prop roots decreases the habitat available for juvenile fishes which inhabit reefs and grass beds when mature.

Some species of fish migrate from coral reefs to grass beds every night and return in the morning. The seagrass beds are therefore subsidizing the reefs in terms of energy flow. In addition to these short-term feeding migrations, there are life-history migrations among ecosystems. For example, juvenile lobsters settle in seagrasses and mangrove prop roots and move out to the coral reefs as they mature. Seagrass blades (particularly those of Syringodium) float for several days after detachment by rough seas or by grazing animals such as parrotfishes and sea turtles. They drift in open water over reefs and grass beds and decompose to become an important source of nutrients for the communities below. The dissolved nutrients from mangrove detritus enhance the productivity of seagrasses.

COASTAL BARRIERS ALONG OTHER COASTLINES OF THE UNITED STATES

The ecosystems, fish and wildlife resources, and values of coastal barriers along the Great Lakes, Hawaii and American Samoa, and the Pacific coast are discussed in Appendixes B, C, and D to this report.

CHAPTER 4

THE CBRA: THE LIMITATION OF GOVERNMENT EXPENDITURES ON COASTAL BARRIERS

This chapter describes the CBRA's limitations on Federal expenditures, the exceptions to these limitations, implementation of the CBRA, and the consultation required by the CBRA. Issues encountered during implementation are identified and briefly discussed. Recommendations regarding these issues are provided at the close of this chapter.

PROHIBITED FEDERAL EXPENDITURES

With certain exceptions, the CBRA prohibits new Federal expenditures and financial assistance for development within the units of the Coastal Barrier Resources System (CBRS). Section 3(3) of the CBRA defines "financial assistance" as "any form of loan, grant, guaranty, insurance, payment, rebate, subsidy, or any other form of direct or indirect Federal assistance," other than certain specified exceptions. This definition also specifically includes Federal flood insurance.

Section 5(a) of the CBRA contains a broad prohibition on new Federal expenditures or new financial assistance for any use that would encourage development within CBRS units. Section 5(b) states that expenditures or financial assistance are "new" and therefore prohibited if no money for construction or purchase was appropriated by Congress before the CBRA was enacted on October 18, 1982. If a contract or legally binding commitment establishing an enforceable right by an individual or entity to Federal funds was entered into by both the Government and the recipient prior to the enactment date, these monies were not considered new. The only exception to the October 1982 effective date for the CBRA's limitations was for Federal flood insurance. The applicable date of the prohibition on flood insurance was set at October 1, 1983.

The CBRA eliminated the expenditure of new Federal revenues or new Federal financial assistance in CBRS units for such items as buildings, airports, roads, bridges, causeways, piers, jetties, seawalls, water supply and sewage systems, utility lines, flood insurance, and VA or FHA loans. The expenditure limitation does not prohibit private financial transactions or the construction of facilities and structures with private funds or funds provided by State and local governments. The prohibition on new Federal expenditures and financial assistance in CBRS units covers all Federal programs unless specifically exempted by the CBRA.

Federal Flood Insurance

The CBRA explicitly states that the term "financial assistance" includes Federal flood insurance. Section 11 of the CBRA amends section 1321 of the National Flood Insurance Act, which prohibited the sale of new Federal flood insurance in coastal areas designated by the Department of the Interior (DOI) according to the provisions of the Omnibus Reconciliation Act (OBRA). The CBRA amendment did not change the basic intent and effect of Section 1321 but merely specified that the prohibition covered the undeveloped coastal barriers identified by the CBRA instead of the OBRA. As a result of the CBRA amendment, new flood insurance has not been available under the authority of the National Flood Insurance Act since October 1, 1983, for any new construction or for substantial improvements of structures located within the CBRS. The amended section also reiterates that federally insured financial institutions may make loans secured by structures not eligible for flood insurance due to this prohibition.

Dwellings within CBRS units presently covered by Federal flood insurance continue to be covered even if the dwelling is sold to another owner since the CBRA only prohibits new flood insurance coverage for any new construction or substantial improvements of structures. The meaning of "substantial improvements" is explained by the legislative history as an improvement, on or after October 1, 1983, which increases the value of the residence by 50% or more. Regulations issued by the Federal Emergency Management Agency on August 16, 1983, detail implementation of this provision. If an insured structure in a CBRS unit is destroyed, any replacement is not eligible for insurance.

Other Restricted Programs

Section 5(a) of the CBRA states that the limitation on new expenditures or new financial assistance includes, but is not limited to:

(1) construction or purchase of any structure, appurtenance, facility, or related infrastructure;
(2) construction or purchase of any road, airport, boat landing facility, or other facility on, or bridge or causeway to, any CBRS unit; and
(3) assistance for erosion control or other stabilization of any inlet, shoreline, or inshore area, except for Louisiana units S01 through S08 and in certain emergencies.

The Department of the Interior has interpreted the CBRA's restrictions to include, but not be limited to, the following programs:

Department of Agriculture

Farmers Home Administration--
Loans for rural disaster relief, water systems, wastewater systems, commercial development, community services, and subdivision development.

Rural Electrification Administration--
Loans for new or expanded electrical systems that would encourage development.

Soil Conservation Service--
Assistance grants.

Department of Commerce

Economic Development Administration--
Grants for planning and administering local economic development programs.

Department of Defense

United States Army Corps of Engineers--
Construction and financial assistance involving beach erosion control, hurricane protection, flood control works, and new or expanded navigation projects.

Department of Energy

Energy development programs.

Department of Housing and Urban Development

Block grants for community development. Mortgage insurance, housing assistance, or rehabilitation subsidy programs. Urban Development Action Grants.

Department of Transportation

Federal Aviation Administration--
Grants for airport planning and development.

Federal Highway Administration--
Federal assistance to states for highway construction.

Urban Mass Transportation Administration--
Capital improvement and operating grants.

Environmental Protection Agency

Grants for wastewater treatment construction (Section 201 grants) and water quality management planning (Section 208 grants).

Federal Emergency Management Agency

National Flood Insurance Program.
Disaster Assistance Program (except as allowed under the CBRA).

Federal Home Loan Administration

Guaranteed housing loans.

General Services Administration

Construction or reconstruction of Federal property for development purposes.

Small Business Administration

Loans to small businesses for disaster relief, upgrading of water treatment systems, and other purposes.

Disaster assistance to homeowners.

Veterans Administration

Home loan guarantees.

Note: This list may not be all inclusive. Each Federal agency is responsible for review of its programs to assure compliance with the CBRA.

The Conference Report (H.R. 97-928) notes that the prohibitions in the CBRA cover structures or facilities within the CBRS as well as other publicly financed facilities such as bridges or causeways that would extend into a System unit. Expenditures outside the CBRS are not affected by the CBRA.

A number of questions regarding the limitation of revenues has arisen since enactment of the CBRA in 1982. The first CBRA-related question concerns the availability of Federal support for facilities such as water and sewer systems, roads, or erosion control projects that can be extended into CBRS units with private funding. Can, under the CBRA, a water or sewer system be built with Federal assistance up to the boundary of a CBRS unit and then completed with State, local, or private funding? Although Federal funds would not technically be expended within the CBRS, the Federal subsidy outside the unit could provide substantial benefits to development of the unit.

Another question arises concerning Federal support of a project that, although not located in a CBRS unit, may affect the unit. For example, if a causeway or bridge to a coastal barrier terminated on a part of the barrier that is not within a CBRS unit, even though a large part of the island may be a designated unit, would the federally subsidized access route therefore represent a Federal subsidy in the CBRS unit? Are measures needed to address such a situation? Should such Federal expenditures be eliminated or prorated to benefit only that portion of the population not in the CBRS unit, or should guidelines be developed by Federal agencies to minimize the effects of such expenditures on CBRS units?

Two examples illustrate how agencies have dealt with these questions. The Federal Highway Administration (FHWA), in its CBRA implementation regulations,

concluded that use of Federal funds for construction of a bridge that terminates on the same barrier, but outside a CBRS unit, is allowed; however, no Federal monies can be used to build a road from that bridge terminus into the CBRS unit, nor can a highway be built up to the boundary of a CBRS unit. The FHWA policy requires federally aided highway projects to connect logical termini; they must not depend on further expansion to make that connection.

In Florida, Brevard County requested that the Environmental Protection Agency (EPA) allow them to extend the service area of a federally funded wastewater treatment plant to include CBRS unit P09A, Coconut Point, and to extend a sewer line through the unit to service major developing areas to the south of the unit. At EPA's request, the DOI reviewed Brevard County's proposal and issued a decision stating that the service area could not be expanded to include the adjacent CBRS unit, and further, Federal monies could not be used to construct sewer lines through the unit to service developing areas to the south. Such a transit line could be constructed with non-Federal monies, but tie-ins within the CBRS unit would remain prohibited.

Another issue concerning the prohibition on Federal assistance contained in the CBRA is whether the term "indirect financial assistance" includes tax benefits derived from tax deductions such as casualty loss, capital gains, depreciation, or mortgage or loan interest expenses. Witnesses at the Congressional hearings on the CBRA suggested that such tax provisions help make development of coastal barrier property, including areas within CBRS units, attractive investments. Federal tax policy is discussed in Chapter 9 of this report.

Finally, some commenters on the CBRA have asked whether technical assistance is included in the prohibition on Federal expenditures and assistance. Section 3(3)(D) specifically exempts assistance for environmental studies, planning, and assessments that are required for Federal permits or other authorizations.

The U.S. Army Corps of Engineers has concluded that their technical assistance program for floodplain management is also not prohibited by the CBRA. The Corps believes that the definition of financial assistance and the activities specifically enumerated in Section 5(a) emphasize financial and not technical assistance. In a letter to the DOI, the Corps stated that:

> The purpose of this type of technical assistance is to evaluate the flood hazard problems to determine the best use of an area, including measures that can be taken by non-federal interests to mitigate flood losses or prevent unwise improvements. Frequently, the solutions recommended include flood warning systems, evacuation plans, relocations, and other non-structural solutions to flood hazard problems. In carrying out the technical assistance activities, we would ensure that our recommendations would not be contrary to the CBRA.

A recent study has suggested that only those types of technical assistance that neither result in resource damage nor promote development, that is, technical assistance consistent with the purposes of the CBRA, be permitted in the CBRS (Kuehn 1984).

FINANCIAL ASSISTANCE ALLOWED UNDER THE CBRA

The CBRA explicitly excludes some forms of Federal assistance from the general prohibition on Federal spending in CBRS units. These exceptions are outlined in Sections 3, 5, and 6 of the CBRA and are briefly discussed below.

Section 3: Exceptions in the Definition of Financial Assistance

General revenue sharing grants. General revenue-sharing grants under Section 102 of the State and Local Fiscal Assistance Amendments of 1972 are excluded from the definition of financial assistance. This program disbursed Federal funds to State and local governments to use according to their own needs without restrictions from the Federal Government; however, the program expired and was not reauthorized in 1986. Prior to 1986, up to 40,000 State and local governments, Indian tribes, and Alaskan native villages received funds at quarterly intervals. Funds were allocated according to interstate and intrastate formulas administered by the Treasury Department's Office of Revenue Sharing. Primary determining factors included population, per capita income, and the general tax effort of recipient governments. Allocations of general revenue sharing funds, therefore, tended to be concentrated in areas with large populations and high adjusted taxes.

Section 10(c)(4) of the CBRA specifically directs the DOI to assess the effects of general revenue sharing grants on CBRS units. General revenue sharing is discussed in Chapter 10 of this report.

Bank insurance and mortages (Ginnie Mae, Fannie Mae, Freddie Mac). Another exception is "deposit or account insurance for customers of banks, savings and loan associations, credit unions, or similar institutions." In addition, the purchase of mortgages or loans by the Government National Mortgage Association (Ginnie Mae), the Federal National Mortgage Association (Fannie Mae), or the Federal Home Loan Mortgage Corporation (Freddie Mac) is not included in prohibited forms of financial assistance. These programs do not subsidize individual mortgages and thus are different from VA and FHA loans, which do subsidize individual loans and are prohibited.

Environmental studies. Section 3 excludes environmental studies, planning and assessments that are required incident to the issuance of permits or other authorizations under Federal law. This means that under the CBRA, assistance for environmental studies, planning, and assessments is allowed for activities required by the National Environmental Policy Act, and for the processing of permits such as those required under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899.

Programs unrelated to development. The term "financial assistance" does not include assistance pursuant to programs entirely unrelated to development of coastal barriers, such as any Federal or federally assisted public assistance program or any Federal old-age survivors or disability insurance program. This exemption includes student loans, Social Security benefits, Medicare and Medicaid, food stamps, and other similar social programs.

Section 5(a)(3): Certain Erosion Control Projects

The CBRA prohibits Federal assistance for stabilization or erosion control projects except in two situations. Section 5(a)(3) states that, in general, erosion control or stabilization projects are prohibited except "in cases where an emergency threatens life, land, and property immediately adjacent to that unit." This means a stabilization project in a CBRS unit (other than in units S01-S08 in Louisiana) is permissible only if an emergency threatens a coastal barrier or mainland area outside of the CBRS and only if this area is "immediately adjacent" to the coastal barrier landform and associated aquatic habitats which compose a CBRS unit.

Section 5(a)(3) also contains a special exception addressing the serious erosion problem along the Louisiana coast. For units S01-S08 in Louisiana, stabilization and erosion control projects may be carried out for any purpose other than encouraging development, that is, to protect fish and wildlife or prevent erosion of the State's seaward boundary.

Section 6(a)(1)-(5): Exceptions Requiring Consultation But Not Consistency with the Purposes of the CBRA

Section 6(a)(1)-(5) lists Federal expenditures that are permitted in the CBRS after consultation with the Secretary of the Interior. Consultation is required to determine whether an expenditure is an exception to the prohibitions of the CBRA. Expenditures in the first five categories listed in the section need not be consistent with the purposes of the CBRA. Expenditures pursuant to Section 6(a)(6) require consultation as well as a determination that they are consistent with the purposes of the CBRA. The consultation process is described more thoroughly later in this chapter.

Energy projects. The CBRA allows Federal expenditures and financial assistance for energy activities. Section 6(a)(1) allows expenditures or financial assistance for "any use or facility necessary for the exploration, extraction, or transportation of energy resources which can be carried out only on, in, or adjacent to coastal water areas because the use or facility requires access to the coastal water body." The legislative history (H.R. 97-841) states that "this provision is intended to be read broadly in terms of energy projects. However, the provision should not be interpreted to allow assistance for projects primarily designed to encourage development but which might be carried out in the guise of energy development." In addition, the language requires the project to be water dependent and therefore would not provide, for instance, for the siting of a power plant not dependent upon access to a coastal body of water.

Channel improvements and related structures. Maintenance of existing channel improvements and related structures, such as jetties, can continue under Section 6(a)(2). The CBRA prohibits the construction of new channels or the enlargement of existing channels. However, the legislative history does state that, due to the unstable nature of coastal barriers, existing channels within the CBRS units can be relocated periodically if necessary.

Section 6(b) stipulates that channel improvements or related structures shall be treated as "existing" only if at least a portion of the money for such improvement or structure was appropriated before enactment of the CBRA on October 18, 1982. The House report explains that:

> The criterion for determining whether federal assistance would or would not be precluded is the existence of the channel at the time of enactment of the legislation. If it is in existence, or if money has been appropriated for its construction, then any federal financial assistance for activities to maintain it, including, for example, the complete reconstruction of jetties or other structures, would be permitted.

The use of disposal sites for dredged materials is included under this exception, as long as the sites are related to, and necessary for, the maintenance of an existing project. It does not appear that the CBRA requires disposal sites to have been in existence at the time of enactment, nor is there a requirement that the location and use of the site be consistent with the CBRA's purposes. Thus, consultation with the DOI is limited to a determination as to whether the activity is in fact maintenance and not a new project; consistency with the purposes of the CBRA is not required. The acting agency is free to determine how and when maintenance is to be done and where the dredged materials will be dumped within the unit. Several commenters asked whether consultation procedures should include discussion and agreement on placement of dredged material, or whether other procedures to maximize environmental protection should be developed. Inadequate dredging and disposal procedures could result in needless loss of valuable fish and wildlife habitat on coastal barriers.

Roads, structures, or facilities. Under Section 6(a)(3), maintenance, replacement, or repair, but not expansion, of publicly owned or publicly operated roads, structures, or facilities that are essential links in a larger network or system can continue after consultation with the DOI. This exception differs from that contained in Section 6(a)(6)(F), which pertains to maintenance of roads, structures, or facilities that may not be essential links in a larger system or network but which must be consistent with the purposes of the CBRA.

The legislative history indicates Congressional intent to include drains, gutters, curbs, and other related roadworks under this exception. "Structures or facilities" is also interpreted to include public utilities and thus could allow Federal assistance in replacing deteriorating water or sewer systems or wastewater treatment works.

Two issues have arisen with regard to this provision. One concerns the meaning of the word "essential." Where maintenance, replacement, or repair of public infrastructure is not consistent with the purposes of the CBRA, this infrastructure must be an essential link in a larger network in order to receive Federal financial assistance. The Federal Highway Administration has declared all existing roads and highways in the Federal-aid System are usually "essential links" by definition; they are by designation important links in a larger network. Several commenters suggested that standards for determining

essentiality be developed and the facts of each case be examined to take into account elements such as whether service to any areas, particularly residential areas, might be eliminated if the maintenance is not performed and whether alternative services are available.

The second issue relates to roads, structures, or facilities that may be built by a private developer but are subsequently transferred to a public agency, thus making them eligible for Federal assistance should maintenance or reconstruction be needed. Unlike channel improvements, public roads or facilities need not have been in existence when the CBRA was enacted in order to be maintained with Federal funds. It is common practice for private developers to construct roads and other such improvements as part of a subdivision development and then dedicate them to a governmental entity for future maintenance. Long-term maintenance of such improvements can be very costly. It is worthwhile to note, however, that FEMA will not provide disaster assistance for any infrastructure constructed in the CBRS after the CBRA was enacted.

Military activities. Section 6(a)(4) exempts "military activities essential to national security" from the CBRA's expenditure limitations. The Conference report (H.R. 97-928) states that the standard for determining the essentiality of military activities is "existing law and procedure." Department of Defense officials have the responsibility of consulting with the DOI before making expenditures within the system under this exception. There has been generally good cooperation between the two Departments in planning use of CBRS lands. For instance, based on discussions with officials at Tyndall Air Force Base in Florida, a consultation agreement has been developed to govern essential day-to-day Department of Defense operations, such as training exercises, in designated units. Some commenters, however, have suggested that military activities excepted from the prohibitions of the CBRA should be required to meet a strict standard of necessity to national defense and that the definition of essential activities and their relationship to potential resource damage or Federal expenditures within a CBRS unit should be carefully considered.

Coast Guard facilities. Section 6(a)(5) contains an exception for the "construction, operation, maintenance, and rehabilitation of Coast Guard facilities and access thereto." This provision allows essential Coast Guard facilities such as search and rescue stations to be constructed and maintained as necessary.

Section 6(a)(6): Exceptions Requiring Consultation and Consistency with the Purposes of the CBRA

Section 6(a)(6)(A) through (G) includes seven additional exceptions to the CBRA's limitation on new expenditures or new financial assistance for projects consistent with the purposes of the CBRA. Federal expenditures or assistance for actions or projects under this section are permitted only after consultation with the DOI and "only if the making available of expenditures or assistance therefor is consistent with the purposes of this Act." As detailed in Section 2(b), the purposes of the CBRA are to minimize loss of human life, wasteful expenditure of Federal revenues and damage to fish, wildlife, and

other natural resources associated with coastal barriers. Thus the consultation required for these expenditures contains two elements: a determination that the proposed expenditure is a valid exception and that it is consistent with the purposes of the CBRA.

Fish and wildlife resources. Section 6(a)(6)(A) contains a broad exemption for fish and wildlife resources and habitats:

> Projects for the study, management, protection and enhancement of fish and wildlife resources and habitats, including, but not limited to, acquisition of fish and wildlife habitats and related lands, stabilization projects for fish and wildlife habitats, and recreational projects.

The legislative history explains that this provision recognizes the value of CBRS units as fish and wildlife habitats as they are in complete conformity with the purposes of the legislation. The full range of Federal financial assistance authorized for protecting and managing fish and wildlife habitats will continue to be available, including funding for acquisition of important habitat under authorities not mentioned, such as the Migratory Bird Treaty Act or the Pittman-Robertson Act. It also includes, where necessary, assistance for stabilization projects to protect valuable habitats. Federal funds for projects involving facilities for fish- and wildlife-related recreation are also allowed. Like all of the exceptions under Section 6(a)(6), any development of recreational facilities in CBRS units must be consistent with the purposes of the CBRA.

Navigational aids and devices. Assistance for the establishment, operation, and maintenance of air and water navigation aids and devices is excepted under Section 6(a)(6)(B). This exception is limited to aids and devices for navigation and does not include airport terminals or runways, boat landing facilities, or marinas.

Land and Water Conservation Fund and Coastal Zone Management Act. Section 6(a)(6)(C) exempts projects under the Land and Water Conservation Fund (LWCF) and the Coastal Zone Management Act (CZMA) from the funding prohibitions of the CBRA if they are consistent with the purposes of the Act.

The LWCF provides money for the acquisition of lands for federally administered parks, wildlife refuges, and recreation areas, and for matching grants for State recreation planning, State and local land acquisition, and State and local development of public outdoor recreation areas and facilities. The role of Federal acquisition in conserving coastal barriers is discussed further in Chapter 7 of this report.

Under the CZMA program, coastal barriers along the Atlantic and gulf coasts have received significant attention by States in the development and implementation of their coastal zone management programs. Many of these participating States have placed restrictions on further development of their coastal barriers. These actions were encouraged by the 1980 amendments to the Coastal Zone Management Act which explicitly recognized the need to preserve the natural protective features of coastal barriers.

Scientific research. Scientific research is exempted under Section 6(a)(6)(D) provided it meets the consistency requirement. This includes, but is not limited to, aeronautical, atmospheric, archeological, space, geologic, marine, fish, and wildlife research, development, and applications.

Emergency actions. Section 6(a)(6)(E) contains an exception for assistance for emergency actions essential to the saving of lives and the protection of property and the public health and safety, if such actions are performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (42 U.S.C. 5145 and 5146) and Section 1362 of the National Flood Insurance Act of 1968 (42 U.S.C. 4103) and are limited to actions necessary to alleviate the emergency.

Section 305 of the Disaster Relief Act authorizes the President, in a declared emergency, to provide such emergency services as are deemed necessary to save lives and protect public health and safety where a disaster either threatens or is imminent. Section 306 of that Act authorizes Federal agencies, in a major disaster or emergency, to provide assistance on the direction of the President to State and local governments and to help distribute medicine, food, and other consumable supplies.

Section 1362 of the National Flood Insurance Act authorizes the Federal Government to purchase flood-damaged structures in flood-risk areas if the property has been repeatedly damaged or is damaged beyond repair, or if a local ordinance precludes rebuilding the flood-damaged structure or makes the cost of rebuilding prohibitive.

In 1988, Congress amended Section 1306 of the National Flood Insurance Act to allow the Federal Emergency Management Agency (FEMA) to pay for the proper demolition or relocation of insured structures that are subject to imminent collapse or subsidence as a result of erosion or undermining by waves or currents. If an insured structure collapses or subsides before the owner demolishes or relocates it and FEMA determines the owner failed to take reasonable and prudent action to demolish or relocate the structure, FEMA will pay the owner only 40% of the value of the structure.

In summary, emergency assistance for lives and property is available within the CBRS only for the purchase, demolition, or relocation of flood-damaged structures under the National Flood Insurance Act or for relief in a declared emergency under the Disaster Relief Act, provided such assistance is consistent with the purposes of the CBRA. It should be noted, however, that FEMA can also provide assistance within the CBRS units for repair or replacement of publicly owned facilities under Sections 6(a)(3) and 6(a)(6)(F) provided those facilities were in place when the CBRA was enacted in 1982.

Roads, structures, or facilities. The maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or publicly operated roads, structures, or facilities is allowed by Section 6(a)(6)(F) if such actions are consistent with the purposes of the CBRA. While section 6(a)(3) provides for maintenance and reconstruction of publicly owned roads or facilities whether or not the project is consistent with the CBRA, that provision is limited to essential links in a larger network or system.

Nonstructural stabilization projects. The final exception, Section 6(a)(6)(G), allows assistance for nonstructural projects that are designed to mimic, enhance, or restore natural stabilization systems. This includes activities that seek to reproduce the natural process through nonstructural means such as planting dune grass or nourishing beaches.

The CBRA thus provides for nonstructural stabilization projects under Section 6(a)(6)(G) if the project is consistent with the purposes of the CBRA. Structural projects intended solely to protect unit property from erosion, in areas outside those designated in Louisiana, are generally not authorized under the CBRA except as permitted under Section 6(a)(6)(A) to protect fish and wildlife habitats.

The comments received on Sections 3, 5, and 6 of the CBRA indicate there is still some misunderstanding among the general public about the CBRA's funding limitations. Many commenters have the erroneous impression that the CBRA prohibits not just Federal expenditures for development, but all expenditures for development in the CBRS, thereby rendering the land in the CBRS useless. These commenters suggest that the CBRA may be construed as a "taking" of private property for which financial compensation should be required. Consistent with Executive Order No. 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, the DOI has reviewed this document and concludes that the actions discussed will not result in a taking of property rights for which just compensation is required under the Fifth Amendment to the Constitution. The CBRA does not affect the rights of landowners to do whatever they wish with their land; therefore, it cannot be interpreted as a taking. The legality of the CBRA has been tested in both Federal District and Appeals Court and has been upheld unanimously.

IMPLEMENTATION

Federal Agency Compliance

Compliance with the funding prohibitions of the CBRA rests with each Federal agency. The innovation of CBRA's concept and the large number of Federal agencies involved have made establishment of policy, guidance, and regulations a slow process. It appears that all affected agencies have prepared policy guidance.

Particularly difficult to implement is the prohibition against projects which may be funded by block grants such as those in the Community Development Block Grants Program. These often involve no-year appropriations that give broad disbursement discretion to State and local governments. Such Federal expenditures could encourage development of CBRS units. The Department of Housing and Urban Development is implementing the CBRA by requiring recipients of community development block grants to assume responsibility for compliance with the CBRA. Recipients must undertake any consultation required and certify that they have complied with the requirements of the CBRA. Some commenters have suggested that coordinated tracking systems be established by Federal agencies to further monitor and ensure compliance; however, such systems would be very expensive to administer.

OMB Certification

Section 7 of the CBRA requires the Director of the Office of Management and Budget (OMB) to make annual certification, on behalf of Federal agencies, that each agency has complied with the provisions of the CBRA during that fiscal year. The certification is submitted by OMB to the House of Representatives and Senate pursuant to the schedule required under the Congressional Budget and Impoundment Control Act of 1974.

The Office of Management and Budget's annual Circular A-11 instructions on preparation and submission of budget estimates describes the procedure to be followed by the agencies to assist OMB in its certification requirements. The instructions state that budget estimates should not include any assistance prohibited by the CBRA. They also direct each agency to include a statement in its budget estimates certifying that no funds were obligated in the past year for purposes prohibited by the CBRA. Relying on these agency statements, OMB makes annual written certification to Congress that each agency has complied with the provisions of the CBRA. Thus OMB's procedure requires that agencies address the CBRA at two stages of the budget process: at the formative stage when they prepare their budget proposals and at the end of the fiscal year when the agency reviews its previous expenditures. The OMB certification process, however, is administratively cumbersome and OMB does not have the capability to audit agency expenditures.

Consultation

As discussed previously, Section 6 requires that a Federal agency consult with the Secretary of the Interior before making funds available for excepted expenditures. The consultation process provides an exchange of ideas and an opportunity for the Secretary to provide an opinion on whether a proposed expenditure falls within an exception to the prohibitions of the CBRA and, for those exceptions described in Section 6(a)(6), whether the proposed action is consistent with the purposes of the CBRA. The consultation responsibility has been delegated to the U. S. Fish and Wildlife Service (FWS). Procedures for Federal agency consultation were published by FWS as Final Advisory Guidelines in the Federal Register on October 6, 1983 (48 Federal Register, No. 195). These guidelines direct Federal agencies proposing Federal expenditures or financial assistance for excepted activities within CBRS units to consult with FWS and allow that agency the opportunity to provide written comments before the expenditure is made.

Generally, the consultation process is carried out at one of two operational levels. Proposed Federal projects identified in an agency's budget proposal are submitted to FWS for comment at least 45 days before transmittal to OMB. FWS reviews the project, consults with the initiating agency as necessary, and provides a written response. Consultation requests for projects such as channel maintenance or highway repair or for other expenditures that are managed by agency field level officials are made through the appropriate Regional Director of FWS. Most activities fall in this category.

There are exceptions to this general rule. The requirements of Sections 305 and 306 of the Disaster Relief Act make prior consultation impractical in

responding to a national disaster. Instead, FWS participates in regional task forces for disasters and emergencies. However, permanent replacement activities related to Section 6(a)(6)(E) require consultation prior to commitment of funds. In addition, the FWS and the Air Force have agreed on an aggregate consultation procedure for essential day-to-day military operations within the CBRS.

Compliance with CBRA's consultation requirements rests on the Federal officer responsible for the proposed expenditure. FWS responds to a consultation request by providing technical information and a written opinion. While this opinion may influence an agency to reconsider its proposal and may result in modifications to minimize adverse impacts to the CBRS unit, the final determination of whether an action is permitted rests with the consulting Federal agency.

The consultation process developed between FWS and affected Federal agencies is in place and generally working well. The FWS Fish and Wildlife Enhancement Division has a long history of working with Federal and State agencies to resolve problems related to impacts of development on fish and wildlife resources. Most consultations are quickly completed through the FWS field offices located in coastal states.

RECOMMENDATIONS

A summary of the public comments received on Sections 3, 5, 6, and 7 of the CBRA is presented in Tables 5 and 6. The official State and Territory positions appear in Table 7. The substantive issues raised by the States and the other commenters have been discussed previously or are indicated below. The DOI has modified its recommendations on Sections 5, 6, and 7 from those proposed in the 1987 Draft Report in response to these comments.

Section 5 Limitations

Section 5(a) prohibits Federal funding for activities within CBRS units. As discussed previously, Federal agencies have had to decide in several instances whether to obligate Federal funds for facilities that are located outside the CBRS but whose service areas may include developments in CBRS units.

In the 1987 Draft Report, the DOI considered a recommendation that guidance be developed to clarify that Federal financial assistance specifically directed to a purpose within the CBRS, even if the project is located outside the CBRS, is prohibited by Section 5(a) of the Act. The States of Massachusetts, New York, Delaware, Maryland, and Mississippi all support the development of such guidance. Upon reevaluating the situations which may arise, however, the DOI concludes that determinations about whether Federal assistance is appropriate can be made on a case-by-case basis, and, therefore, makes no recommendation for general guidance.

Recommendation: The DOI recommends no changes in Section 5.

Section 6 Exceptions

Section 6 lists exceptions to the general prohibitions in Section 5(a) on Federal expenditures within the CBRS. Federal agencies must consult with DOI (FWS) before obligating funds for any of the exceptions that are permitted. Ambiguities in the wording of several of the exceptions and different interpretations among Federal agencies have created apparent conflicts with the purposes of the CBRA.

(a) Essential link (roads). Section 6(a)(3) allows expenditures for the repair, replacement, or reconstruction of facilities that are "essential links" in a larger network or system. Under Section 6(a)(6)(F), expenditures for the repair, replacement, or maintenance of these roads, structures, or facilities are allowed when the expenditure of Federal revenues will be consistent with the purposes of the CBRA.

In the 1987 Draft Report, the DOI proposed eliminating Section 6(a)(3) entirely. The States of Massachusetts, Maryland, Delaware, and Mississippi supported that proposal. As the States of New York and Florida and several other commenters pointed out, however, there are some roads that should legitimately be considered essential links and the repair or replacement of these roads should be allowed even if it is not consistent with the purposes of the CBRA.

Recommendation: The DOI recommends no change in Section 6(a)(3).

(b) Essential line (utilities). Because of the large recommended increase in the amount of associated aquatic habitat included in each CBRS unit, many commenters were also concerned that utilities, especially rural electric cooperatives and water and sewer companies, would not be able to service adequately customers on developed coastal barriers because they could not afford to cross the CBRS without Federal assistance. It was not the intent of the CBRA to penalize those living on developed coastal barriers, nor does the DOI want to discourage the construction or use of sewage treatment plants that will lessen the detrimental environmental impacts of malfunctioning package treatment plants and septic systems on developed barriers.

Recommendation: The DOI recommends an amendment to Section 6 to allow utilities (1) to use Federal monies for the purposes of putting in "essential lines" through the CBRS where no practicable alternative route exists to service one or more developed areas on coastal barriers outside the CBRS, and (2) to provide service to developments within the CBRS from existing lines or "essential lines" which cross through the CBRS, provided that service can be supplied with no additional costs to the Federal Government. If any upgrades are necessary to accommodate such service within the CBRS, the DOI recommends that their costs be borne by non-Federal parties.

The DOI believes that the potential environmental benefits resulting from this recommendation will outweigh any potential contributions to the development of the barrier. Once the original Federal outlay for the "essential line" is

made, it is the DOI's intent that no additional Federal costs result from allowing tie-ins.

(c) Dredged material disposal. Section 6(a)(2) allows dredged materials to be disposed within the CBRS after consultation with the DOI, but without special consideration for the purposes of the CBRA. In the 1987 Draft Report, the DOI considered a recommendation that Section 6(a)(2) be amended to require dredged material disposal to be performed in a manner consistent with the purposes of the CBRA. The States of Massachusetts, Connecticut, New York, Delaware, Maryland, and Mississippi all supported such a recommendation. Such a recommendation, however, runs counter to the basic CBRA premise that conservation can be achieved without increasing Federal regulatory involvement. Dredged material disposal is already regulated by Federal programs that take fish and wildlife values into account.

Recommendation: The DOI recommends no change in Section 6(a)(2).

(d) Recreational projects. Section 6(a)(6)(A) clearly allows fish and wildlife management and conservation to occur within the purposes of the CBRA. Rhode Island and Connecticut, however, have raised questions regarding the extent of allowable outdoor recreation and requested that if otherwise protected areas continue to exist in, or are added to the CBRS, then this section should be clarified to allow outdoor recreation, so long as it complies with the purposes of the CBRA. However, the DOI is not recommending that otherwise protected lands remain in or be added to the CBRS. This should alleviate the States' concerns without requiring any changes in Section 6(a)(6)(A).

Recommendation: The DOI recommends no amendment to Section 6(a)(6)(A).

Federal Agency Compliance and Block Grants

As discussed previously, block grants related to development, such as the Community Development Block Grant Program, often involve no-year appropriations that give broad discretion to State and local governments. Such Federal expenditures could, if not carefully monitored, inadvertently be used for development of CBRS units. Therefore, both the States of Massachusetts and Delaware support a CBRA amendment to require Federal agencies to track block grants to assure that no funds are spent within the CBRS.

Recommendation: The DOI recommends no amendment to address block grants. The Department believes that most agencies have incorporated compliance with the CBRA into regular program activities. The benefits derived from amending the law to require Federal agencies responsible for disbursing Federal funds to States and localities to establish coordinated tracking systems to monitor and assure compliance with the CBRA would be outweighed by the costs of implementation.

Section 7-OMB Certification

The Section 7 certification process, as currently administered by OMB, is cumbersome and OMB does not have the capability required to audit agency expenditures. Therefore, in the 1987 Draft Report, the DOI proposed that

Section 7 be deleted from the CBRA. Many commenters, including the States of Massachusetts, Delaware, and Florida, objected to this and some commenters suggested that the certification requirement be transferred to the General Accounting Office, which can conduct audits.

Recommendation: The DOI recommends that Section 7 be amended to require each Federal agency to self-certify that they have complied with the provisions of the CBRA during the previous fiscal year and submit notice of that certification to Congress on an annual basis.

Table 5. Summary of public comments received on amendments to Section 5 and Section 6 of the CBRA proposed in the 1987 Draft Report. More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	Add Section 5 Guidelines		Eliminate Essential Link- Section 6(a)3		Dredge Disposal Only if Consistent Section 6(a)2		No Clarification of Recreation Projects Section 6(a)(6)(A)	
	For	Against	For	Against	For	Against	For	Against
Alabama	0	0	1	0	1	0	1	0
California	3	0	2	0	2	0	2	0
Dist. of Columbia	3	3	3	2	4	1	2	0
Florida	9	2	10	1	10	0	9	1
Illinois	0	0	1	0	1	0	1	0
Maryland	2	0	1	0	2	0	0	0
Massachusetts	4	0	3	0	3	0	2	0
New Jersey	1	0	3	0	3	0	3	0
New York	1	0	2	0	2	0	2	0
Ohio	0	0	0	0	0	0	0	1
Pennsylvania	3	0	3	0	3	0	3	0
Rhode Island	0	0	1	0	1	0	1	0
South Carolina	1	0	1	1	1	0	1	0
Texas	3	0	3	0	4	0	3	1
Virgin Islands	0	0	0	0	1	0	0	0
Virginia	0	1	0	0	3	0	0	1
	30	6	34	4	41	1	30	4

Table 6. Summary of public comments received on technical assistance, block grants, and Section 7--OMB certification. More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	No Guidance on Technical Assistance		No Block Grant Monitoring		Eliminate Section 7-OMB Certification	
	For	Against	For	Against	For	Against
Alabama	1	0	1	0	0	2
California	1	0	2	0	0	1
Dist. of Columbia	3	0	2	0	1	2
Florida	6	0	9	0	0	11
Illinois	1	0	1	0	0	0
Iowa	0	0	0	0	0	1
Maine	0	0	0	0	0	1
Maryland	0	0	0	0	0	2
Massachusetts	2	0	2	0	0	4
New Jersey	3	0	3	0	0	2
New York	2	0	2	0	0	1
Ohio	0	0	0	0	0	1
Pennsylvania	2	0	2	1	0	2
Rhode Island	0	0	1	0	0	0
South Carolina	1	0	1	0	0	1
Texas	3	0	2	2	0	5
Virgin Islands	0	0	0	0	0	2
Virginia	0	0	0	0	0	1
Washington	0	0	0	0	0	1
	25	0	28	3	1	40

Table 7. State and Territory positions on DOI's proposed technical amendments to the CBRA as presented in the March 1987 Draft Report to Congress. + = for DOI recommendation, - = against DOI recommendation, o = no comment.

ISSUE	ME	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	AL	MS	LA	TX	PR	VI	No. States for DOI Position	No. States Against Position
Add Section 5 Guidelines	o	+	o	o	+	o	+	+	o	o	o	o	o	o	+	o	o	o	o	5	0
Section 6																					
eliminate essential link	o	+	o	o	-	o	+	+	o	o	o	o	-	o	+	o	o	o	o	4	2
dredge disposal if consistent	o	+	o	+	+	o	+	+	o	o	o	o	o	o	+	o	o	o	o	6	0
no recreation projects amendment	o	+	-	-	o	o	+	o	o	o	o	o	o	o	+	o	o	o	o	3	2
No Technical Assistance Guidance	o	+	o	o	o	o	+	o	o	o	o	o	o	o	+	o	o	o	o	3	0
No Block Grant Monitoring	o	-	o	o	o	o	-	o	o	o	o	o	o	o	+	o	o	o	o	1	2
Eliminate Section 7 - OMB Certification	o	-	o	o	o	o	-	o	o	o	o	o	-	o	+	o	o	o	o	1	3

CHAPTER 5

EXPANSION OF THE DEFINITION AND DELINEATION OF COASTAL BARRIERS AND RECOMMENDATIONS FOR ADDITIONS TO OR DELETIONS FROM THE CBRS

EVOLUTION OF THE DEFINITION AND DELINEATION OF COASTAL BARRIERS

In recent years, coastal managers have increasingly asked for more information about natural coastal systems, particularly for data on how these systems are affected by development, and thus coastal scientists have been involved in the planning process for our shorelines. One specific focus of policy-related research has been to define and describe coastal barriers, to identify them on the ground, categorize them according to their level of development and protective status, and to delineate them on maps. This emphasis reflects the early recognition that any coastal barrier policy would have to be applied to specific sites.

The Federal definition and delineation of coastal barriers have evolved gradually since 1977. With every iteration, the growing scientific understanding of these systems, especially regional and local variation in barriers and barrier use by people, has been incorporated. While understanding has improved continuously, a truly rigorous definition with appropriate amplification was not required until enactment of the Omnibus Budget Reconciliation Act in 1981 (OBRA). On January 17, 1982, a draft document of definitions and delineation criteria that was prepared by the DOI was circulated for public comment. On August 16, 1982, the final definitions and delineation criteria used for the proposed OBRA designations were published (47 Federal Register No. 157). Congress generally followed the OBRA delineations when it designated the existing CBRS in 1982.

This chapter begins by outlining the development of the 1982 definitions and delineation criteria and the problems that were encountered when applying them to designate the proposed OBRA units. It then presents and discusses the somewhat expanded definitions and delineation criteria used for the purposes of this report. The chapter ends with general recommendations for additions to or deletions from the CBRS based on these criteria.

Development of Coastal Barrier Definitions and Delineation Criteria

On the basis of the scientific literature and communication with prominent coastal scientists, six characteristics that would definitively and consistently define coastal barriers were identified.

1. Coastal barriers are subject to the impacts of coastal storms and sea-level rise and are, in varying degrees, hazardous for permanent human use and occupancy;

2. Coastal barriers buffer the mainland from the impact of storms;

3. Many coastal barriers protect and maintain productive estuarine systems which support the Nation's fishing and shellfishing industries;

4. Most coastal barriers consist primarily of unconsolidated sediments;

5. Coastal barriers are subject to wind, wave, and tidal energies; and,

6. Coastal barriers include associated landward aquatic habitats which the fastland (nonwetland) portion of the coastal barrier protects from direct wave attack.

Most barrier islands, barrier spits, bay barriers, and tombolos share these characteristics and therefore represent variations in coastal barrier landforms.

The first three characteristics in the list above, the functional characteristics, largely determine the value of undeveloped coastal barriers to society and were crucial in establishing the national interest in protecting them. The functional characteristics of coastal barriers, however, are not easily measured, and, therefore, are of limited usefulness in delineating barriers on the ground or on maps. Reliable scientific methods and information are not available to assess the degree of hazard for development, the buffering capacity, and the ecological productivity and economic value of aquatic habitats consistently, accurately, and at reasonable cost for hundreds of specific areas from Maine to Texas.

A definition of coastal barrier landforms based upon structural and compositional characteristics that could be observed with a minimum of interpretation on maps and aerial photographs, as well as on the ground, seemed the most practical and cost-effective. The CBRA definition therefore focused on the last three characteristics listed above, which, with relatively little amplification, proved sufficient to identify most coastal barriers on the ground. These characteristics were consistently incorporated into the various definitions of coastal barriers prepared by the DOI between 1977 and 1982 when the CBRA was enacted.

The definitions of coastal barrier landforms are primarily scientific. On the other hand, the delineation criteria, while scientifically based, are also pragmatic. Procedures for boundary delineation must be concise, related to features on the ground, and applicable consistently over the full range of coastal barrier variation. Based on the scientific understanding of coastal barriers, the delineation criteria for the existing CBRS provided for inclusion of associated aquatic habitats, particularly wetlands, adjoining the fastland on the landward side of barriers. Equally important, these delineation criteria were written to include the sand-sharing system (i.e., the

offshore bars and littoral drift zone) on the seaward side of the barrier and the adjacent inlets, which are "associated aquatic habitats."

The delineation criteria adopted in 1982 relied almost exclusively on features that were observable both on the ground and on maps and aerial photographs. Notable among these features were changes in the land surface at the juncture of bay barriers and spits with the mainland, the deepest portions of channels and inlets, and continuous natural or artificial channels closest to the fastland portion of the barrier on the landward side. A difficulty arose in delineating the seaward boundary of coastal barriers because of uncertainty about the physical dimensions of the sand-sharing system for most, if not all, units. For this reason, the seaward boundary was not delineated in the 1982 maps of CBRS units.

One of the most important results of the 1982 efforts to delineate coastal barriers was the development and application of visual indicators of these landforms. Scientists indicated that a linear or curvilinear beach had to be present for the landform to be considered a coastal barrier. This kind of beach provides evidence that sufficient wind-, tidal-, and wave-energies, as well as an adequate supply of sediment, exist to satisfy the statutory definition. Mudflats, exposed marshes, and other emergent coastal features lacking this linearity were thus clearly distinguished from coastal barriers. The requisite associated aquatic habitats--open water, wetlands, and other landward aquatic habitats of all sorts--are readily recognizable on topographic maps, in aerial photographs, and on the ground.

Development Status

The difficulty in distinguishing developed from undeveloped coastal barriers lies in the fact that relatively few are pristine. Many barriers have been visibly altered and others that may seem undeveloped contain some structures, such as State highways or other minor recreational facilities. In addition, only a portion of a coastal barrier may be developed. Hence, determining whether a coastal barrier was developed required the establishment of several thresholds. This involved the application of three tests.

1. Does the area contain few human-made structures (few defined as less than one structure per 5 acres of fastland)?

2. Do any structures or human activities significantly impede geologic and ecological processes (i.e., is the area able to function naturally)?

3. Is the undeveloped area large enough (i.e., does it include at least 1/4-mi of shoreline on the ocean and extend from beach to bay)?

As with the definition of the coastal barrier landform, the definition of "development" has been refined and clarified since 1977 in response to a growing understanding of the effects of coastal barrier development. It was not until 1979, for instance, that establishing a transitional category of

coastal barrier development became desirable. When undeveloped coastal barrier units were identified in 1982 for reference in the OBRA, "phased development" was recognized as a special class of developing coastal barrier. Under this concept, minimally developed or undeveloped portions of coastal barriers were excluded if they were planned from the outset for a continuous program of multi-stage development by a single developer and the first stage of the development had already been substantially completed. Phased development was claimed by a large number of landowners during the 1982 DOI designation of undeveloped coastal barriers for OBRA purposes, and this concept subsequently received a great deal of attention and was quite controversial. Because it was so difficult to make consistent determinations about phased development, phased development was not considered in determining development status after 1982.

A number of criteria have evolved to delineate the undeveloped portions of coastal barriers, three of which were central: (1) that undeveloped coastal barriers should extend from the beach across the barrier to the landward aquatic habitat, (2) that each unit should encompass at least a 1/4-mi of ocean-facing shoreline, and (3) that this minimum shoreline length should be determined from the "break in development" on the fastland. The beach-to-bay and minimum shoreline length criteria reflect an understanding that coastal barriers are interrelated and dynamic systems, which are adversely affected by the stabilization of adjacent areas. In addition to these three criteria, the definitions provided in the OBRA and the CBRA indicate that areas are to be considered undeveloped if human activities do not significantly impede natural geomorphic and ecological processes and few human-made structures are present.

Completed development on coastal barriers is obvious in aerial photographs, on large-scale maps drawn since the development was completed (such as recent USGS 7.5 minute quads), and on the ground. For a partially developed coastal barrier, however, determining where development ends and where the undeveloped portion of the barrier begins (particularly in terms of human impact) is sometimes difficult. Usually, the boundary line was simply drawn along the "break" in structural development. Determining whether a coastal barrier was beginning to develop (i.e., had a full complement of infrastructure or was part of a phased development) was even more complicated. Because water and sewer lines (and sometimes electric and telephone lines) are placed in the roadbed, the existence of improved roads laid out in a pattern similar to roads in developed areas in the vicinity was found to be a fairly reliable indicator that a coastal barrier, or a portion of one, was undergoing development. This indicator can be readily observed in aerial photographs. Conversely, if the roads were unimproved or revegetating or if there was just a throughway with no radials, it was questionable whether the area was actively being developed. There were no reliable visual indicators of phased development. Aerial photographs as well as on-the-ground inspection, were generally used to verify the completed stages of a phased development that was otherwise fully documented. Some phased developments were excluded in 1982 if a developer could prove that a least one phase of the development exceeding 100 units had been completed and that the developer had viable plans, means, and intent to promptly move forward to construction of the next phase.

Protected Status

In 1982, Congress specifically excluded from the CBRA definition of an "undeveloped coastal barrier" any area that was "included within the boundaries of an area established under Federal, State, or local law, or held by a qualified organization as defined in Section 170(h)(3) of the Internal Revenue Code of 1954, primarily for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes." About one-third (34%) of the Atlantic and gulf coast falls into this "otherwise protected" category.

The only recommendation in the Secretary of the Interior's August 1982 Report to Congress as required by OBRA was that the statutory definition of undeveloped coastal barriers be modified so that such "otherwise protected" areas could be included under the Act. This recommendation reflected concern that privately owned land within the authorized boundaries of these areas (inholdings) could be developed and granted Federal flood insurance and that some protected areas could become available for future development. This occurred in 1980 when the portion of Texas' Padre Island National Seashore south of Mansfield Cut was deauthorized by the Congress. If other such areas currently classified as otherwise protected become available for residential or urban development, it may be desirable to preclude Federal expenditures within such areas.

Coastal barriers held for conservation purposes were identified in the 1985 draft National inventory. A coastal barrier, or portion thereof, was defined as "otherwise protected" if it has been withdrawn from the normal cycle of private development and dedicated for conservation, wildlife management, public recreation, or scientific purposes. Protected status requires that there be evidence of an intent on the part of the administrator to protect the coastal barrier. This definition included:

1. areas established under a Federal, State, or local law which stipulates the purpose(s) of protection;

2. areas established by a Presidential Proclamation under the Antiquities Act of 1906, or under a Federal, State, or local executive directive which has its basis in law;

3. areas subject to deed restriction or a conservation easement which withdraws it from the normal development cycle and establishes the purposes of protection;

4. areas administered by an agency of the Federal, State, or local government under a lease which stipulates the purposes of protection;

5. areas held by an organization within the scope of Section 170 (h)(3) of the Internal Revenue Code of 1954, primarily for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes;

6. areas where the owner has established the intent to protect the area through a master plan or similar document establishing the purposes of the area; and

7. areas where the owner has provided a written statement documenting the intention to protect the area.

A review of protected areas by the Coastal Barriers Study Group in 1985 revealed that most of the federally subsidized development that occurs is necessary to allow access and accommodate visitors to publicly managed conservation or recreation areas. More than 95% of the beach-oriented recreational use of federally protected areas occurs on coastal barriers. All nine Atlantic Ocean and Gulf of Mexico coastal units of the National Park System that provide a significant amount of beach recreation are on coastal barriers with the exception of certain beaches on Cape Cod. These coastal barriers supported a total of 30 million visits in 1984, up from 22.5 million visits in 1979 and 8.9 million visits in 1977 (U.S. Department of the Interior 1983; Platt 1985). Much of this use is moderate or low intensity resource-oriented recreational and educational activity. Recent estimates show an average of 6 million visits annually to 20 of the 50 National Wildlife Refuges located on the Atlantic and Gulf of Mexico coastlines.

State and local governments also protect coastal barriers and provide for public recreation. The large urban populations in the Northeast have created substantial demands for beach facilities. In New England, New York, and New Jersey, town beaches--often contiguous with the town and planned to provide beach recreation for residents during the summer--are common. In the southeastern and gulf states, where urbanization is generally less intensive and more recent, beach use tends to be associated with private residential development. In Florida, where urbanization pressure is greatest, the State is making a considerable effort to develop local parks to satisfy the increasing public demand.

Although a few of the protected areas contain substantial amounts of permanent public recreational development, most are undeveloped, contain scattered public and private development of a temporary nature (such as board-walks, dune crossings, picnic areas, campsites), or contain only a single developed area of bathhouses and other facilities to support beach recreation.

In addition to the public parks, about a score of coastal barriers are effectively protected as wildlife sanctuaries and research areas by private conservation organizations such as the Audubon Society and The Nature Conservancy (TNC). Exclusion of these privately owned, otherwise protected areas from the CBRS generally increases their market value which can increase the incentive to the owners to subdivide and sell the properties to acquire property elsewhere that may be more valuable to the conservation organization.

For example, on Dog Island, Florida, property owned in 1982 by The Nature Conservancy and excluded under the provisions of the CBRA for that reason, has since been sold and can be developed using the full range of Federal financial assistance and with full access to Federal flood insurance. Other landowners on Dog Island, whose property is also undeveloped but is included in the CBRS, are unable to purchase flood insurance or acquire other Federal financial assistance. A recommendation to address this problem appears later in this chapter.

Other Coastlines

The existing CBRS established in 1982 only includes coastal barriers on the Atlantic Ocean and Gulf of Mexico coasts. During 1983-85, however, the Coastal Barriers Study Group gathered preliminary information about coastal barriers on all U.S. coastlines, including the Great Lakes, the Pacific coast, Alaska, Hawaii, and American Samoa. Draft maps of these coastal barriers were published as part of the 1985 National inventory.

This endeavor was quite controversial. Many commenters in 1985 opposed a CBRS expansion to other coastlines, including most of the Governors of the affected States. Some of these commenters argued that the barriers on these coastlines were very different geologically from the Atlantic and gulf coastal barriers and thus they did not qualify for addition to the CBRS. Others argued that because Congress did not address the possibility of including barriers on these coastlines in 1982, it did not intend the CBRA to apply to these areas.

In the 1987 Draft Report, the DOI did not include the barriers on coastlines other than the Atlantic Ocean and Gulf of Mexico in the proposed recommendations and many commenters favoring expansion wrote opposing this. The Governors of Ohio, Michigan, and Wisconsin all wrote supporting a CBRS expansion into the Great Lakes. In 1987, members of Congress from the Great Lakes States introduced independent legislation to require a study and recommendations to Congress on appropriate areas for addition to the CBRS in these States.

The legislative history does not clearly indicate whether Congress intended to expand the CBRS eventually to include other coastlines. Additional studies and consideration are necessary before the DOI could make specific recommendation about the undeveloped coastal barriers on these coastlines. Because the Congressional intent is unclear and there is so much controversy surrounding expansion to other coastlines, the DOI will complete the studies of other coastlines only if Congress enacts legislation directing it to do so.

DEFINITION OF UNDEVELOPED COASTAL BARRIERS FOR PURPOSES OF THIS REPORT

This section presents the coastal barrier definitions and delineation criteria developed in response to the Congressional mandate in Section 10(c)(2) of the CBRA that this report include recommendation for additions to, or deletions from, the CBRS and modifications to the boundaries of the CBRS. These definitions and delineation criteria are based on guidance provided by Section 3 and are supported by definitions used previously by the DOI as well as by the legislative history of the CBRA (47 Federal Register No. 157; U.S. Department of the Interior 1983). These definitions and delineation criteria were used to identify the new units recommended for addition to the CBRS.

General Definition

For the purposes of this report, a coastal barrier is generally defined as a depositional geologic feature (such as a bay barrier, tombolo, barrier spit,

or barrier island) which is subject to wave, tidal, and wind energies and protects landward aquatic habitats including the adjacent wetlands, marshes, estuaries, inlets, and nearshore waters.

Types of Coastal Barriers

Coastal barriers may be described generally, with respect to their relationships to the mainland, as bay barriers, tombolos, barrier spits, and barrier islands. The mainland includes the continental landmass as well as large islands such as Long Island, New York, and Martha's Vineyard, Massachusetts. The accepted scientific classification of major coastal barrier landforms includes:

1. Bay Barriers--coastal barriers that connect two headlands, and enclose a pond, marsh, or other aquatic habitat (Figure 15a). The term "bay mouth bar," or "bay bar" is synonymous with bay barrier.

2. Tombolos--sand or gravel beaches which connect one or more offshore islands to each other or to the mainland (Figure 15b). Coastal barriers of this type occur principally in New York and New England. The terms "connecting bar," "tie bar," and "tying bar" are synonymous with tombolo.

3. Barrier Spits--coastal barriers which extend into open water and are attached to the mainland at only one end (Figure 15c). They can develop into bay barriers if they grow completely across a bay or other aquatic habitat. On the other hand, bay barriers can become spits if an inlet is created.

4. Barrier Islands--coastal barriers completely detached from the mainland (Figure 15d). Barrier spits may become barrier islands if their connection to the mainland is severed by creation of a permanent inlet. The barrier island represents a broad barrier beach, commonly sufficiently above high tide to have dunes, vegetated zones, and wetland areas.

Composition of Coastal Barriers

Generally, coastal barriers consist entirely of unconsolidated sediment composed of sand or gravel. Sometimes, however, sediments include silt, cobbles, or larger rocks or may be consolidated. Three additional areas that function as coastal barriers include:

1. Areas containing carbonate-cemented deposits, such as:

    a. local deposits of beach rock occurring on a coastal barrier--found in tropical and semitropical regions, consisting of carbonate-cemented gravel and/or beach sand underlain or overlain by unconsolidated sediment.

    b. cemented dunes--found as local features in Puerto Rico where a carbonate-cemented dune line is located immediately seaward of a more or less typical coastal barrier, consisting of a beach (which may extend seaward to the cemented dune), dune, and mangrove. Cemented

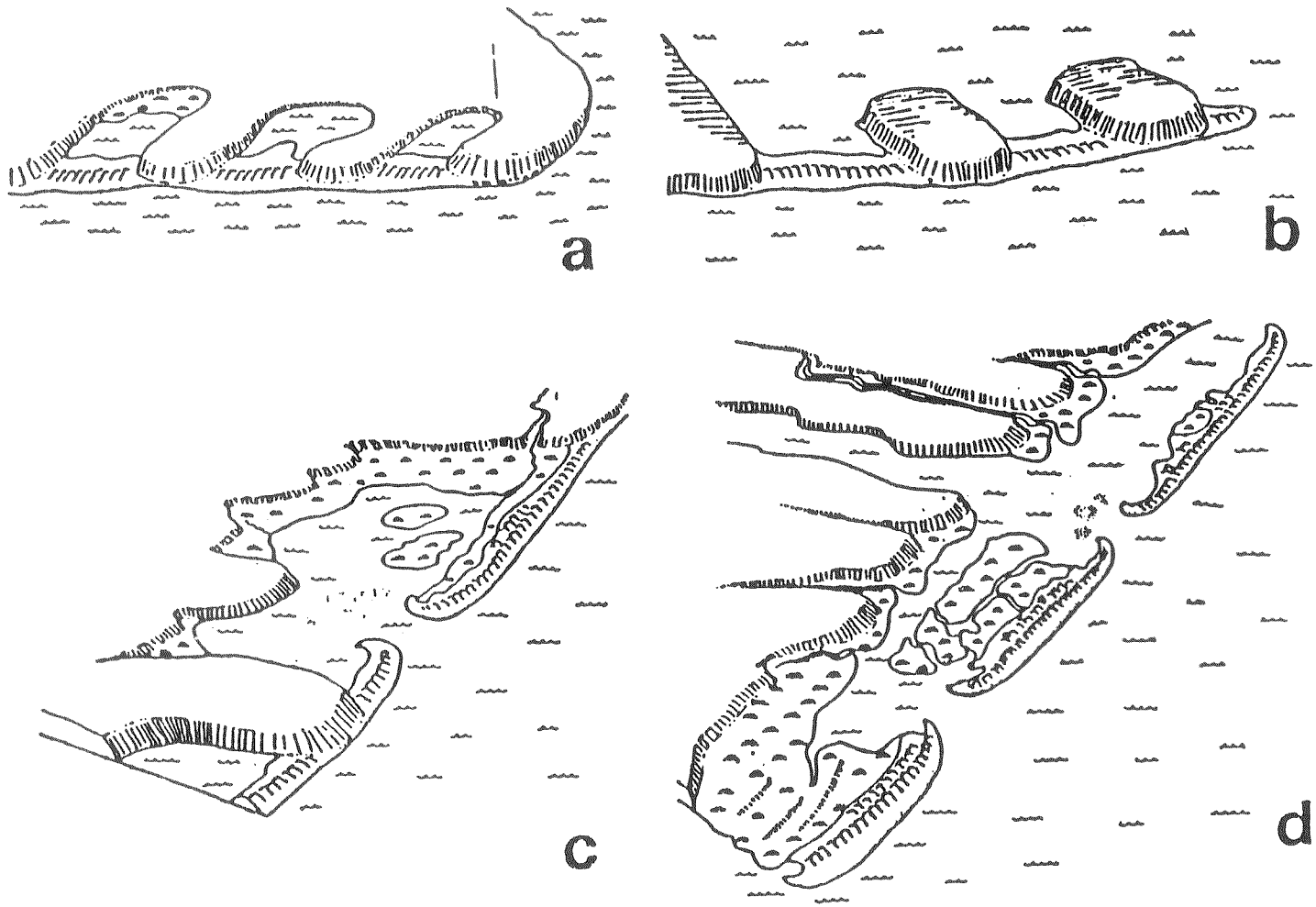


Figure 15. Four examples of coastal barriers along the Atlantic and gulf coasts of the United States: (a) bay barriers; (b) tombolos; (c) barrier spits; (d) barrier islands.

deposits may be local, as in the case of beachrock, or extensive, as in the case of the emergent portions of the Florida Keys.

2. Areas consisting primarily of silt and clay, such as:

   a. fringing mangroves--nearshore deposits of silt and clay stabilized by mangroves as islands (overwash mangroves), and bands of mangrove along subtropical or tropical mainland shores in areas of low wave-energy. Many of these areas are located behind coral reefs. Fringing mangroves and associated reef systems are considered coastal barriers in tropical and subtropical areas because the protection afforded the associated aquatic habitat and mainland is comparable to that given by coastal barriers that contain a linear or curvilinear beach.

   b. cheniers--narrow, wooded beach ridges generally following the shoreline, and parallel to and enclosing marsh and mud-flat sediments on the landward side. Fine-grained shoreline sediments typically occur seaward of the chenier. The plain extending along the coast of southwestern Louisiana is characterized by a series of these cheniers.

3. Areas containing glacial and bedrock deposits--areas consisting of discontinuous outcrops of bedrock and coarse glacial deposits that make up less than 25% of the coastal barrier landform above mean high water. The substantial wave-energies in the area where glacial deposits occur (primarily New England) frequently move sediments and change their composition.

Factors that Shape Coastal Barriers

Wind, waves, and tides are the immediate forces which maintain or modify coastal barriers. The actions of wind, waves (directly and by creating littoral, onshore-offshore, or other currents), and tidal energy on unconsolidated sedimentary materials generally result in continuous linear or curvilinear features--a beach ridge or berm located along the unprotected (seaward) side of the coastal barrier. Irregularities in the shape of the beach and breaks in the continuity of the linear or curvilinear features are admissible under these expanded definitions. Such breaks in linearity are found most often in coastal barriers located in embayments, tide-dominated barrier systems, and chenier shorelines.

Where a suitable sediment source and sufficient wind, wave, and tidal energy exist, secondary coastal barriers occasionally develop on the mainland side of large bays or lagoons behind coastal barrier systems. Many of these secondary coastal barriers are included in the recommendations.

Associated Aquatic Habitat

Associated aquatic habitat includes all wetlands (e.g., tidal flats, swamps, mangroves, and marshes), lagoons, estuaries, coves between the barrier and the mainland, inlets, the nearshore waters seaward of the coastal barrier including the sand-sharing system, and, in some tropical areas, the coral reefs associated with nearshore mangroves. Under normal weather conditions, only aquatic habitats immediately adjacent to the coastal barrier are under

any threat of wave attack. Major coastal storms, however, routinely affect the entire landward aquatic habitat, which the coastal barrier protects in varying degrees. Therefore, the protected area is considered to comprise the area subject to diminished wind, wave, and tidal energy due to the presence of the coastal barrier during a major storm.

This somewhat expanded definition is consistent with the definition of coastal barriers outlined in the CBRA and reflects the specific conservation purposes of the CBRA to protect the fish, wildlife, and other natural resources of coastal barriers. All such associated aquatic habitats are inseparable parts of the coastal barrier ecosystem. All aquatic habitat between a coastal barrier and the mainland is protected by the coastal barrier from direct wave attack. Protection of this habitat and the mainland itself from wave attack during major storms has long been recognized as a fundamental function of coastal barriers.

Undeveloped

Once a coastal barrier was identified, the development status of the unit was determined using the guidance in the CBRA:

1. Few human-made structures:

   A unit is considered undeveloped if it contains fewer than one structure per 5 acres of fastland. A human-made structure is defined as a walled and roofed building constructed in conformance with Federal, State, or local legal requirements, with a projected ground area exceeding 200 ft^2.

2. The structures and human activities do not significantly impede geomorphic and ecological processes:

   If a unit contains fewer than one structure per 5 acres of fastland, it is considered undeveloped except when geomorphic and ecological processes are altered to the extent that the long-term perpetuation of the coastal barrier is threatened.

3. Any portion thereof:

   The CBRA does not require an entire coastal barrier to be included, and specifically allows for the inclusion of undeveloped portions of coastal barriers. An undeveloped portion of a coastal barrier is included if there exists a minimum of about 1/4-mi of shoreline on the unprotected (seaward) side of the coastal barrier. Each unit must include an undeveloped area extending through the fastland from the beach to the associated landward aquatic habitat, and must independently satisfy the definition of a coastal barrier. At the request of Rhode Island and Connecticut, however, certain areas in these States with a beach length less than 1/4-mi have been included in the recommendations.

To determine whether a coastal barrier or portion thereof contained development, the most recent topographic maps and/or aerial photographs available were reviewed to identify walled and roofed structures and Federal and State

technical personnel were consulted. Study Group members also visited many sites. Detailed assessment of the status of infrastructure was not possible, given limitations of available information and resources. When landowners wrote to the DOI, however, claiming a full complement of infrastructure was in place in their property, the claims were investigated. Where a full complement of infrastructure (roads, water and electric lines) provided by the developer to each lot or building site was verified, the barrier was considered developed. Because phased developments proved so difficult to verify and were so controversial in 1982, phased development was not considered in determining development status for the purposes of this study.

DELINEATION OF UNDEVELOPED COASTAL BARRIERS FOR PURPOSES OF THIS REPORT

Once an undeveloped, unprotected coastal barrier was identified according to the definitions presented above, boundary delineations of the potential coastal barrier units were made in the manner discussed below.

Delineation of Landward Boundary

On the landward side, the boundary is a line which encompasses the fastland core of the coastal barrier itself as well as associated aquatic habitat consisting of wetland (including tidal flats), shoals, islands, channels, and open water landward of the fastland portion of the coastal barrier. In general, the landward boundary of coastal barriers, as defined to include associated aquatic habitats, follows some natural or cultural feature within or landward of the aquatic system. Such features should be recognizable on available maps or aerial photographs as well as on the ground.

Two basic types of aquatic environments, or combinations thereof, occur landward of coastal barriers. Each requires a somewhat different application of the general "landward boundary delineation" rule. These aquatic environments and the specific applications of the "landward boundary delineation" rule are as follows:

1. General case:

   The landward boundary is a continuous line which follows the interface between the aquatic habitat and the mainland, as defined on topographic maps or aerial photographs by a change in vegetation. The boundary is drawn not more than 5 mi landward of the mean high water line on the unprotected side of the coastal barrier (Figure 16a).

2. Special conditions:

   a. Open water body greater than 1-mi wide landward of coastal barrier.

      The boundary is drawn through the open water approximately 1 mi landward of the farthest landward extent of wetlands on the protected side of the coastal barrier (Figure 16b). If a discernable natural channel, artificial channel, or political boundary exists in the open water approximately 1 mi landward of the coastal barrier, it is used

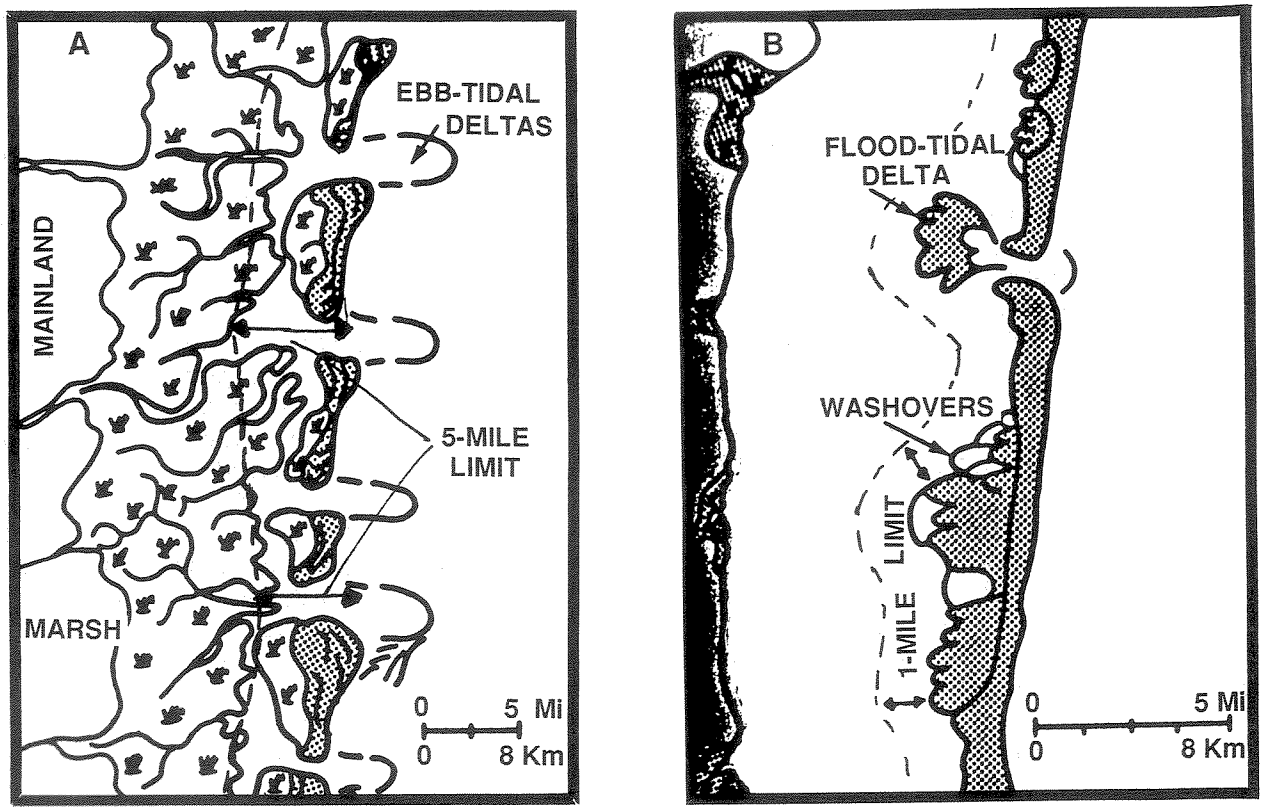


Figure 16. Landward boundary delineation in common coastal barrier settings. A shows a typical case along shorelines where the landward boundary is drawn within the associated aquatic habitat approximately 5 mi from the mean high tide line on the unprotected side of the coastal barrier. B shows a typical case along shorelines where the landward boundary is drawn through open water approximately 1 mi landward of the emergent wetlands on the protected side of the coastal barrier.

as the landward boundary. For natural and artifical channels, the boundary is drawn along the side nearest the coastal barrier.

b. Continuous wetlands that extend more than 5 mi landward of the coastal barrier.

The boundary is generally drawn through the wetlands along an identifiable natural channel, artificial channel, or political boundary nearest to the 5-mi limit in the manner described in (1). If such features are lacking, the boundary is drawn through the wetland generally parallel to and 5 mi landward of the mean high water line on the unprotected side of the coastal barrier.

c. Coastal Plain remnants.

Coastal Plain remnants present special delineation problems, especially along the coasts of South Carolina, Georgia, and northeastern Florida. These isolated upland landforms are located within the coastal zone between the present shoreline and the more continuous uplands of the Coastal Plain and are the result of coastal sedimentation at a higher stand of sea level than the present one. Coastal Plain remnants are generally surrounded by wetland habitats. Where all or part of the Coastal Plain remnant is responding to modern wind, wave, and tidal energies, it is treated as a primary or secondary barrier. Where the Coastal Plain remnant is not significantly impeding or altering the processes in the surrounding wetlands due to large size or high elevation, it is included in the associated aquatic habitat up to 5 miles landward of the present shoreline. Where Coastal Plain remnants begin to form a more-or-less continuous line within the wetlands, the landward boundary is drawn along the seaward margin of the Coastal Plain remnants, excluding them from the unit.

d. Watercourses that flow into the aquatic habitat from the mainland.

The boundary is drawn at the first natural or artificial constriction with the drainage landward of the coastal barrier.

e. Coastal barriers within large embayments and secondary coastal barriers within bays and lagoons.

Because of limited energy affecting these coastal barriers, the boundary is drawn as described in the "general case" above, but at not more than 1 mi landward of the mean high water line on the unprotected side of the coastal barrier.

Delineation on the Seaward Side

Each unit contains the entire sand-sharing system, including the beach, shoreface, and offshore bars. The sand-sharing system of coastal barriers is normally defined by the 30-ft bathymetric contour. In large coastal embayments (e.g., Chesapeake Bay, Delaware Bay, Narragansett Bay), the sand-sharing system is more limited in extent. In these cases, the sand-sharing system is

defined by the 20-ft bathymetric contour or a line approximately 1 mi seaward of the shoreline, whichever is nearer the coastal barrier.

Delineation of Undeveloped Barriers

Undeveloped coastal barriers, or portions thereof, were delineated using U.S. Geological Survey topographic quadrangle maps and, when available, recent aerial photography. Development status was determined primarily on the basis of the density of visible structures. The following delineation criteria are used:

1. Undeveloped area adjoins continuous development

   The boundary is generally drawn perpendicular to the undeveloped shoreline across the entire coastal barrier and the associated landward aquatic habitat at the break in development.

2. Undeveloped area contains isolated clusters of structures

   Clusters of approximately 10 or more structures are specifically excluded from the unit where the impact of the development on geological and ecological processes is local and confined primarily to the fastland on which the structures are located. A boundary is drawn around the cluster of development to exclude it from the unit.

3. Partially undeveloped coastal barriers: inclusion of associated aquatic habitat.

   Only that associated aquatic habitat that is behind the undeveloped portion of the coastal barrier is included in cases where the coastal barrier is partially developed. The boundary of the associated aquatic habitat is delineated in accordance with the criteria described in the previous section.

RECOMMENDATIONS FOR ADDITIONS TO OR DELETIONS FROM THE CBRS

The Department of the Interior's recommendations for additions to or deletions from the CBRS are based on the coastal barrier definitions and delineation criteria presented in the last section. The DOI recommends major changes in the CBRS in the Florida Keys, Puerto Rico, and the Virgin Islands, and concerning associated aquatic habitat, secondary barriers, military and Coast Guard lands, and otherwise protected barriers. Each of these recommendations is discussed below. Tables 8-10 present summaries of the public comments received on the recommendations. Table 11 gives the official State and Territory positions on the recommendations.

Definition of Coastal Barriers

Section 3(1)(A) of the CBRA defines a coastal barrier as a depositional geologic feature (such as a bay barrier, tombolo, barrier spit, or barrier island) that--(i) consists of unconsolidated sedimentary materials, (ii) is

subject to wave, tidal, and wind energies, and (iii) protects landward aquatic habitats from direct wave attack.

Although coastal barriers generally consist of unconsolidated sediment, as explained previously, they can sometimes contain carbonate-cemented deposits (such as the Florida Keys), silt and clay (such as fringing mangroves and cheniers), or discontinuous outcrops of bedrock or coarse glacial deposits. To allow the definition of coastal barriers to be expanded to include these areas, an amendment to the CBRA to delete the reference to unconsolidated materials is necessary.

> Recommendation: The DOI recommends that the definition of coastal barriers in Section 3(1)(A) of the CBRA be amended by deleting subparagraph (i). The DOI also recommends that all undeveloped unprotected coastal barrier areas meeting DOI definitions be added to the CBRS and that any coastal barrier areas not meeting DOI definitions that were erroneously included in the CBRS in 1982 be deleted from the CBRS. Individual recommendations for additions to or deletions from the CBRS in each State or Territory are contained in the 21 State and Territory atlases (Volumes 2-22 of the report). A summary of these recommendations appears in Table 12.

Geographic Scope

When the CBRA was enacted in 1982, Congress only included coastal barriers on the Atlantic Ocean and Gulf of Mexico coastlines in the CBRS. The legislative history does not clearly indicate whether Congress intended to expand the CBRS eventually to include other coastlines. As discussed previously, however, during 1983-85 the Coastal Barriers Study Group gathered preliminary information about undeveloped coastal barriers on all U.S. coastlines. Although this endeavor resulted in draft maps and a large amount of data, additional studies and consideration are necessary before the DOI can make specific recommendations about the undeveloped coastal barriers along the Pacific coast, Great Lakes, Alaska, Hawaii, and American Samoa. Because Congressional intent is unclear and there is so much controversy surrounding expansion to other coastlines, the DOI does not plan to complete the studies of other coastlines unless Congress enacts legislation directing it to do so.

Undeveloped and unprotected coastal barriers in the Florida Keys, Puerto Rico, and the Virgin Islands were not included in the CBRS in 1982. These barriers border the Atlantic Ocean and are subject to the same dynamic forces and development pressures as other Atlantic coastal barriers. They fully qualify for addition to the CBRS under the DOI's expanded definitions (see previous recommendation).

> Recommendation: The DOI recommends that the undeveloped, unprotected coastal barriers of the Florida Keys, Puerto Rico, and the Virgin Islands be added to the CBRS. The DOI also recommends that the additions to the CBRS in the Florida Keys do not include U.S. Highway 1 because it is the only means of entry to and exit from the islands and should be exempted for safety reasons.

The State of Florida supports the addition of the undeveloped barriers in the Keys to the CBRS. The Commonwealth of Puerto Rico opposes the addition of its barriers to the CBRS; the Territory of the Virgin Islands supports the addition of its barriers to the CBRS.

Associated Aquatic Habitats

The CBRA defines an "undeveloped coastal barrier" to include all associated aquatic habitats: "adjacent wetlands, marshes, estuaries, inlets, and nearshore waters." This definition reflects the specific conservation purposes of the CBRA to protect the fish, wildlife, and other natural resources of coastal barriers. All such associated aquatic habitats are inseparable parts of the coastal barrier ecosystem. The original units of the CBRS, however, include only minimum aquatic habitat because the 1982 Congressional designations were based on Departmental delineations for a prohibition on just the sale of Federal flood insurance as required by OBRA. These delineations focused on the undeveloped fastland portion of the barriers, where residential development might occur.

Coastal barriers protect the aquatic habitats between the barrier and the mainland. These habitats are critically important to many fish and wildlife species, including most of the Nation's commercial fish and shellfish harvest. The barrier and its associated habitats are one ecological system, and the health and productivity of the entire ecosystem depends on the rational use of all the components.

"Associated aquatic habitat" includes all wetlands (e.g., tidal flats, swamps, mangroves, and marshes), lagoons, estuaries, coves between the barrier and the mainland, inlets, the nearshore waters seaward of the coastal barrier including the sand-sharing system and, in some tropical areas, the coral reefs associated with nearshore mangroves. Under normal weather conditions, only aquatic habitats immediately adjacent to coastal barriers are exposed to direct wave attack. Major coastal storms, however, routinely affect the entire landward aquatic habitat. Such habitat survives major storms because coastal barriers receive the brunt of the ocean's energies. Storm waves break on the barrier beach, leaving a diminished storm wave to travel into the wetland. At the same time, the wetland stores storm flood waters, easing the flood pressure on the mainland. Associated aquatic habitat is considered to comprise the entire area subject to diminished wind, wave, and tidal energy during a major storm because of the presence of the coastal barrier. It is delineated to include up to a 1-mi expanse of open water or a 5-mi expanse of marsh behind a barrier, including those Coastal Plain remnants seaward of the continuous Pleistocene landmass.

> Recommendation: The DOI recommends that all of the aquatic habitats associated with the existing CBRS units and included in the recommended new units be added to the CBRS.

Navigation Channels

In the 1987 Draft Report the recommended additions of associated aquatic habitat included several Federal navigation channels maintained by the U.S.

Army Corps of Engineers. Many commenters, including some State and local governments, are concerned about the impacts of this inclusion on plans to deepen channels to accommodate larger vessels.

> Recommendation: The DOI has adjusted the boundaries of several individual unit recommendations to exclude major shipping channels such as the Brownsville Ship channel. Furthermore, DOI recommends specifically excluding all existing Federal navigation channels, including the Intracoastal Waterway, by reference to allow widening and deepening or study thereof, of such channels.

The environmental effects of channel improvements are assessed through appropriate Federal and State regulatory programs; these programs generally also serve the purposes of the CBRA.

Secondary Barriers

Secondary barriers are located in large, well-defined bays (e.g. Narragansett Bay, Chesapeake Bay) or in lagoons on the mainland side of coastal barrier systems if a suitable sediment source and sufficient wind, waves, and tidal energy exist. They are maintained primarily by internally generated wind waves rather than open ocean waves. Consequently, they are generally smaller and more ephemeral than barriers along the Atlantic Ocean or Gulf of Mexico. Nonetheless, these secondary barriers are formed of unconsolidated sediments just like most oceanic barriers and, more importantly, they also protect important fish and wildlife habitat and provide substantial protection for the mainland during major storms.

> Recommendation: The DOI recommends that secondary barriers be added to the CBRS.

Otherwise Protected Coastal Barriers

Congress excluded from the CBRS undeveloped coastal barriers that are "included within the boundaries of an area established under Federal, State, or local law, or held by a qualified organization as defined in Section 170(h)(3) of the Internal Revenue Code of 1954, primarily for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes" (hereinafter referred to as "otherwise protected" areas). About one-third (34%) of the Atlantic and gulf coast falls into this otherwise protected category.

In his 1982 "Report to Congress on Undeveloped Coastal Barriers," the Secretary recommended that otherwise protected coastal barriers be included in the CBRS to ensure that owners of property within the boundaries of these areas not be granted Federal flood insurance. Most of the federally subsidized development that occurs in otherwise protected areas, however, is necessary to allow access and accommodate visitors.

The States of Maine, Massachusetts, Rhode Island, Connecticut, and North Carolina all favor the inclusion of otherwise protected barriers in the CBRS. These States feel that public ownership is not a guarantee of environmental protection and that Federal monies could be used for wasteful and

inappropriate purposes on the these barriers if they are not included in the CBRS. The States of New York, Delaware, Mississippi, and Texas support the exclusion of otherwise protected barriers from the CBRS.

> Recommendation: The DOI recommends that all privately owned property that is within but is not a part of an otherwise protected area (i.e. inholdings) on an undeveloped coastal barrier be included in the CBRS. Where accurate maps of inholdings were available (e.g. for the National Seashores and Wildlife Refuges), inholdings are included on the CBRS maps (see appropriate State volumes). Where such information was lacking, inholdings on undeveloped otherwise protected coastal barriers are included by reference.
>
> The DOI also recommends that all otherwise protected areas in the existing CBRS be deleted. However, if any public or privately owned, otherwise protected area on an undeveloped coastal barrier is ever made available for development that is inconsistent with the CBRA purposes or the long-term conservation of the barrier, the DOI recommends that it then automatically be included in the CBRS. An amendment to the CBRA providing a legislative directive to the DOI to develop guidelines for acceptable development and automatic inclusion of otherwise protected areas is necessary.

These guidelines could be similar to the Secretary's Standards for Historic Preservation used to certify Historic Preservation Tax Credits and should be developed with opportunity for public comment. Lack of adherence to these guidelines would constitute justification for automatic inclusion in the CBRS. Federal expenditures on otherwise protected coastal barriers should support recreation, education, and conservation activities that are consistent with the maintenance of the natural environment. The guidelines used to judge acceptable development could include, but not be limited to the following:

- the development is necessary to fulfill the purpose of the area;
- the development and its use can be accommodated on the barrier without significantly interrupting natural geological or ecological processes,
- the development is located landward of the primary dunes and on the most stable portion of the barrier.

The otherwise protected coastal barriers are identified on the maps in Volumes 2-22 of the report.

Military and Coast Guard Lands

The Congress included three military installations and one Coast Guard station comprising 42 miles of beachfront and about 15,000 acres in the CBRS in 1982. During the 1985 inventory, an additional 29 undeveloped coastal barriers containing approximately 45 mi of beachfront and 30,000 acres of military and Coast Guard lands in Maine, Maryland, Virginia, North Carolina, Georgia, Florida, and Puerto Rico were also identified.

Section 6 of the CBRA exempts "military activities essential to National security" and "the construction, operation, maintenance, and rehabilitation of

Coast Guard facilities and access thereto" from the restrictions of the CBRA after consultation with the DOI. It is the DOI's understanding that most military activities along the Atlantic and gulf coastlines are essential to National security. Compliance with the National Environmental Policy Act and other environmental safeguards is required of the military and Coast Guard. Under the Sikes Act, the U.S. Fish and Wildlife Service works with the military to develop fish and wildlife conservation plans for their installations.

Recommendation: The DOI recommends that the military and Coast Guard lands currently included in the CBRS be deleted and that no new military or Coast Guard lands be added to the CBRS.

Table 8. Summary of public comments received on expanding the geographic scope of the CBRS. This table does not include the comments on individual CBRS units. Individual unit summaries are presented in the State atlases (Volumes 2-22). More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	CBRS Expansion		Include Florida Keys		Include Puerto Rico & Virgin Islands		Exclude Pacific and Great Lakes Coasts	
	for	against	for	against	for	against	for	against
Alabama	6	0	2	0	2	0	0	3
Alaska	1	0	1	0	1	0	0	1
Arizona	5	0	5	0	5	0	0	5
Arkansas	2	0	1	0	1	0	0	2
California	48	0	21	0	21	0	4	73
Colorado	14	0	9	0	9	0	0	14
Connecticut	10	0	2	0	2	0	0	7
Delaware	1	0	0	0	0	0	0	0
Dist. of Columbia	8	1	5	0	6	0	3	4
Florida	178	78	137	19	36	0	0	69
Georgia	5	2	1	0	1	0	0	4
Hawaii	3	0	0	0	0	0	0	3
Idaho	1	0	1	0	1	0	0	1
Illinois	25	0	17	0	17	0	0	26
Indiana	10	0	10	0	9	0	0	14
Iowa	5	0	4	0	4	0	0	5
Kansas	3	0	3	0	3	0	0	3
Kentucky	6	0	4	0	4	0	0	6
Louisiana	1	0	1	0	1	0	0	1
Maine	5	0	2	0	2	0	0	3
Maryland	32	0	16	0	16	0	0	27
Massachusetts	16	0	5	0	5	0	0	12
Michigan	27	0	14	0	14	0	0	34
Minnesota	23	0	13	0	13	0	0	25
Mississippi	6	0	1	0	1	0	0	2
Missouri	4	0	3	0	3	0	0	5
Nebraska	0	0	0	0	0	0	0	0
Nevada	1	0	1	0	1	0	0	1
New Hampshire	3	0	1	0	1	0	0	3
New Jersey	37	0	30	0	30	0	0	35
New Mexico	1	0	1	0	1	0	0	2
New York	42	0	22	0	22	0	0	45
North Carolina	16	0	4	0	4	0	0	9
North Dakota	0	0	0	0	0	0	0	0
Ohio	33	0	23	0	22	0	2	46
Oklahoma	4	0	3	0	3	0	0	4

(continued)

Table 8. (Concluded).

State	CBRS Expansion		Include Florida Keys		Include Puerto Rico & Virgin Islands		Exclude Pacific and Great Lakes Coasts	
	for	against	for	against	for	against	for	against
Oregon	3	0	2	0	2	0	0	8
Pennsylvania	31	0	21	0	21	0	0	32
Puerto Rico	3	0	0	0	3	0	0	0
Rhode Island	6	0	4	0	4	0	0	4
South Carolina	8	0	3	0	2	0	0	4
South Dakota	0	0	0	0	0	0	0	0
Tennessee	4	0	2	0	2	0	0	3
Texas	146	16	18	0	18	0	0	53
Utah	1	0	1	0	1	0	0	1
Vermont	2	0	1	0	1	0	0	2
Virgin Islands	6	0	2	0	6	0	0	2
Virginia	26	1	12	0	12	0	0	18
Washington	22	0	13	0	13	0	0	29
West Virginia	17	0	1	0	1	0	0	17
Wisconsin	34	0	9	0	9	0	0	38
Wyoming	0	0	0	0	0	0	0	0
	891	98	452	19	356	0	9	705

Table 9. Summary of public comments received on associated aquatic habitat, secondary barriers, and military and Coast Guard lands. More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	Add Associated Aquatic Habitats		Add Secondary Barriers		Delete and Exclude Military and Coast Guard	
	For	Against	For	Against	For	Against
Alabama	0	0	2	0	0	2
Alaska	1	0	1	0	0	1
Arizona	4	0	5	0	0	5
Arkansas	1	0	1	0	0	2
California	19	0	21	1	0	39
Colorado	7	0	9	0	0	12
Connecticut	2	0	2	0	0	4
Delaware	0	0	0	0	0	0
Dist. of Columbia	7	1	7	2	4	5
Florida	67	0	35	1	0	45
Georgia	2	0	1	0	0	3
Hawaii	0	0	0	0	0	0
Idaho	0	0	1	0	0	1
Illinois	13	0	15	0	0	20
Indiana	7	0	9	0	0	9
Iowa	2	0	4	0	0	4
Kansas	3	0	3	0	0	3
Kentucky	4	0	4	0	0	6
Louisiana	0	0	1	0	0	1
Maine	2	0	2	0	0	4
Maryland	11	0	22	0	0	28
Massachusetts	6	0	6	0	0	8
Michigan	10	0	13	0	0	15
Minnesota	9	0	12	0	0	17
Mississippi	1	0	1	0	0	1
Missouri	3	0	3	0	0	3
Nebraska	0	0	0	0	0	0
Nevada	1	0	1	0	0	1
New Hampshire	0	0	1	0	0	2
New Jersey	28	0	30	0	0	35
New Mexico	0	0	1	0	0	2
New York	16	0	21	0	0	35
North Carolina	4	0	4	0	0	12
North Dakota	0	0	0	0	0	0
Ohio	20	0	23	0	0	22
Oklahoma	2	0	3	0	0	4
Oregon	2	0	2	0	0	3
Pennsylvania	13	0	20	0	0	21
Puerto Rico	2	0	0	0	0	0
Rhode Island	6	0	6	0	0	4

(continued)

Table 9. (Concluded).

State	Add Associated Aquatic Habitats		Add Secondary Barriers		Delete and Exclude Military and Coast Guard	
	For	Against	For	Against	For	Against
South Carolina	3	0	3	0	0	4
Tennessee	2	0	2	0	0	3
Texas	19	1	20	2	0	23
Utah	0	0	1	0	0	1
Vermont	1	0	1	0	0	2
Virgin Islands	3	0	1	0	0	2
Virginia	10	0	15	0	1	18
Washington	10	0	13	0	0	19
West Virginia	1	0	1	0	0	3
Wisconsin	9	0	9	0	0	10
	333	2	358	6	5	464

Table 10. Summary of public comments received on otherwise protected coastal barriers and privately owned inholdings on those barriers. More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	Delete in Existing CBRS and Exclude		Automatic Inclusion If Develop		Add Inholdings to CBRS	
	For	Against	For	Against	For	Against
Alabama	0	0	0	0	2	0
California	0	3	0	0	2	0
Dist. of Columbia	0	4	2	1	5	2
Florida	2	49	30	0	6	0
Georgia	0	1	0	0	0	0
Illinois	0	1	0	0	1	0
Maine	0	1	0	0	1	0
Maryland	0	5	0	0	2	0
Massachusetts	0	6	1	0	2	0
Mississippi	0	1	0	0	0	0
New Jersey	0	0	0	0	3	0
New York	1	3	0	0	4	0
North Carolina	0	2	0	0	0	0
Ohio	0	1	1	0	1	0
Oklahoma	0	1	0	0	0	0
Pennsylvania	0	2	0	0	1	0
Rhode Island	0	3	0	0	0	0
South Carolina	1	1	0	0	2	0
Texas	1	4	0	0	4	0
Virgin Islands	0	1	1	0	2	0
Virginia	1	2	1	0	2	0
Washington	0	1	0	0	0	0
	6	92	36	1	40	2

Table 11. State and Territory positions on DOI's proposed additions to and deletions from the CBRS presented in the March 1987 Draft Report to Congress. + = for DOI recommendation, - = against DOI recommendation, o = no comment.

ISSUE	ME	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	AL	MS	LA	TX	PR	VI	No. States for DOI Position	No. States Against Position
Geographic Scope																					
Expansion in General	+	+	+	+	+	+	+	+	+	+	+	-	+	o	+	o	-	-	+	14	3
Add Florida Keys	o	o	o	o	o	o	o	+	o	o	o	o	+	o	+	o	o	o	o	3	0
Add Puerto Rico & Virgin Islands	o	o	o	o	o	o	o	+	o	o	o	o	o	o	+	o	o	-	+	3	1
Other Coastlines-Further Study	-	o	o	o	-	o	o	o	o	o	o	o	o	-	+	o	o	o	o	1	3
Add Associated Aquatic Habitat	-	o	+	+	-	o	+	+	o	+	o	o	+	o	+	o	-	o	o	7	3
Add Secondary Barriers	o	o	+	+	o	o	+	+	o	+	o	o	o	-	+	o	o	o	o	6	1
Otherwise Protected																					
Delete in existing CBRS and exclude	-	-	-	-	+	o	+	o	o	-	o	o	o	o	+	o	+	o	o	4	5
Automatic inclusion if develop	o	o	o	o	+	o	+	+	o	o	o	o	o	o	+	o	o	o	o	4	0
Include inholdings	o	o	o	o	+	o	+	+	o	o	o	o	o	o	+	o	o	o	o	4	0
Exclude Military & Coast Guard lands	o	-	o	o	-	o	o	o	o	-	o	o	o	o	+	o	o	o	o	1	3

Table 12. Summary of recommendations for changes in the CBRS.

State	Number of existing CBRS units	Number of units with recommendations	Shoreline length in CBRS (miles)	Shoreline length with recommendations (miles)	Total acreage in CBRS	Total acreage with recommendations	Fastland acreage in CBRS	Fastland acreage with recommendations
Maine	12	25	10.0	22.5	1,045	4,640	485	1,005
Massachusetts	44	60	70.7	119.3	17,214	66,290	3,871	6,904
Rhode Island	11	20	17.7	25.7	4,791	8,851	1,058	1,436
Connecticut	11	15	8.2	7.5	3,045	3,741	333	302
New York	12	42	21.0	45.0	4,635	18,399	1,131	1,965
New Jersey	0	8	0	13.5	0	5,486	0	396
Delaware	2	4	17.1	17.5	1,565	6,945	517	740
Maryland	0	36	0	28.0	0	7,163	0	1,605
Virginia	4	52	13.8	80.5	11,298	52,831	1,148	3,479
North Carolina	8	6	54.6	32.6	31,913	29,741	8,610	4,579
South Carolina	13	14	38.4	42.4	26,885	76,130	4,511	4,586
Georgia	6	6	16.2	19.9	33,073	64,255	5,126	5,506
Florida	33	65	118.8	172.4	61,575	305,200	19,378	39,511
Alabama	3	4	17.6	19.0	10,678	11,058	2,940	2,722
Mississippi	4	6	9.6	12.8	4,309	5,981	557	662
Louisiana	12	17	91.7	180.0	59,243	353,340	4,518	12,747
Texas	11	19	161.0	180.0	181,565	199,401	46,751	48,498
Puerto Rico	0	42	0	56.9	0	21,486	0	2,473
Virgin Islands	0	20	0	13.4	0	2,740	0	587
TOTAL	186	461	666.4	1,088.9	452,834	1,243,678	100,934	139,703

CHAPTER 6

AN OVERVIEW OF ALTERNATIVES FOR CONSERVING FISH AND WILDLIFE RESOURCES OF THE COASTAL BARRIER RESOURCES SYSTEM

INTRODUCTION

The enactment of the CBRA in 1982 represented a significant step towards the establishment of a consistent Federal policy on undeveloped coastal barriers. The effect of the CBRA was to break the cycle of Federal expenditures used to encourage development and redevelopment of undeveloped coastal barriers. The CBRA seeks to achieve its purposes by withdrawing most of the Federal subsidies that may influence development decisions. This is important because one of the CBRA purposes is to minimize the damage to fish and wildlife resources associated with the CBRS, many of which are dependent upon the availability of undisturbed coastal habitat. This habitat is also an attractive location for residential and commercial development, which does not always take into account the needs of fish and wildlife or the hazards such coastal areas often experience.

The next several chapters of the report address management alternatives for conservation of coastal barrier resources pursuant to the requirements outlined in Section 10 of the CBRA.

FEDERAL STEWARDSHIP

There are a number of alternatives within existing authorities that are potentially useful for conservation of the resources in the CBRS. Some of the more traditional alternatives include: acquiring sensitive areas through fee-simple transactions; acquiring conservation easements in privately owned areas without purchasing the land outright; limiting access to sensitive areas; regulating usage through issuing permits containing performance standards; implementing management programs for the enhancement of endangered or threatened species; managing or altering habitat for the enhancement of priority species; and zoning areas for recreational or other low intensity usages. These management techniques are currently being used in some parts of the CBRS.

In certain instances, fee-simple acquisition is the most effective management strategy in a gross sense as it places the resources under the indisputable control of the Government. Access is relatively easy to control and impacts are relatively easy to monitor. Although acquisition can be especially useful in protecting priority areas and thus has considerable merit as a management

tool, it cannot be expected to provide for the protection of the entire CBRS, particularly if it is expanded as the DOI recommends. Coastal real estate comes at a premium price that is increasingly difficult to justify in terms of the taxpayer's expense, especially given the variety of other resource management tools available.

Regulations are another vital component of a comprehensive conservation strategy. For example, many of the birds associated with the CBRS are partially protected from human depredation by the various migratory bird laws administered by the Fish and Wildlife Service. Endangered and threatened species are protected by the Endangered Species Act. Section 10 of the Federal Rivers and Harbors Act requires that the Army Corps of Engineers review and approve any proposed project affecting the navigable waters of the United States, and Section 404 of the Federal Clean Water Act requires permits for disposal of dredged materials in U.S. waters and adjacent wetlands. Many key coastal areas, including wetlands, beaches, and coastal barriers, are also protected by a variety of State and local land use regulations enacted to prevent development from encroaching upon high priority natural areas.

Traditional conservation practices, together with increased public awareness, have resulted in several dramatic conservation successes in coastal areas. The resurgence of the American alligator is an outstanding example. Once on the verge of extinction due to loss of habitat and over-hunting for their hides, these animals have staged a comeback of such proportions that, in some areas, controlled harvesting of wild alligators for hides and meat is permitted. This would have been impossible without aggressive habitat management and law enforcement. The brown pelican is another good example of a conservation success story. Pelican populations declined rapidly during the 1960's and early 70's due primarily to the accumulation of toxic pesticides in their food supply, namely, coastal fishes. Regulatory control of these pesticides and a carefully planned schedule of introducing pelicans back into previously occupied areas has resulted in the reestablishment of this species throughout most of its former range. Other examples include sea turtles, manatees, and migratory waterfowl. In each case, careful management through habitat acquisition or regulatory protection or both has resulted in improvement of the resource.

STATE COASTAL CONSERVATION PROGRAMS

All Atlantic and Gulf Coastal States have in place some form of coastal management program. These States, with the exception of Georgia and Texas, also participate in the National Oceanic and Atmospheric Administration (NOAA) Coastal Zone Management Program (CZM). The Coastal Zone Management Act of 1972, as amended, is administered by the Secretary of Commerce. It was enacted to encourage States to exercise their authority to provide balanced management of their resources. One principle function of CZM is to review and evaluate State coastal zone management programs in those States which choose to participate in the Federal program. The program also allocates Federal financial assistance for the administration of the approved State coastal management programs.

To obtain approval of their CZM programs, States must inventory their important coastal resources, including coastal barriers. They must also identify permissible land and water uses in their coastal zones and establish enforceable policies to balance competing demands for use of limited coastal resources. Approved State CZM programs must address the national coastal management objectives in the Coastal Zone Management Act, including protection of coastal resources (specifically including barrier islands) and management of development to minimize losses due to natural hazards. Because coastal barriers are valuable natural resource areas and improved management of development in these areas is essential to avoid losses caused by natural hazards, coastal barriers have received significant attention in the development and implementation of State CZM programs, particularly along the Atlantic and gulf coasts.

Although the treatment of coastal barriers varies from state to state, the State programs can be categorized generally. First, all federally approved State CZM programs control development in their coastal zones through State permitting programs and through consistency review of Federal activities affecting land and water uses in the coastal zone. Most of these permitting programs take into account the values of special resource areas such as beaches, dunes, and wetlands associated with coastal barrier systems. The specific provisions of the permitting programs vary by state. New Jersey has a State permitting program which regulates large scale development; in Massachusetts, the Wetlands Protection Act regulates development on barrier islands; the coastal regulatory programs in North and South Carolina are designed to protect barrier islands from development which would adversely affect their natural values; and Rhode Island has adopted a policy which prohibits development on undeveloped barrier beaches and has specific safety requirements for additional development on beaches which are partially developed.

Second, a number of States have enacted special area protection laws affecting barrier islands. Beach and dune protection statutes in State coastal programs in North and South Carolina, Alabama, Delaware, and Maryland, for example, promote the siting of development away from these fragile and hazard-prone areas, thereby limiting losses due to erosion and storm damage. North Carolina has also designated ocean and inlet hazard areas as "areas of environmental concern." Within these areas, regulations to protect people and property include minimum oceanfront setbacks, beach and dune protection requirements, limits on new erosion control structures that could adversely affect adjacent areas, construction standards, and limits on growth-inducing infrastructure such as roads, bridges, and sewers.

Third, like North Carolina, other States have instituted more stringent reviews of infrastructure decisions under the policies of approved programs. For instance, South Carolina's management program includes policies to discourage new public investments in infrastructure which serve undeveloped barrier islands. Similarly, New Jersey has adopted a Shore Protection Master Plan to give special review to infrastructure projects which might affect sensitive areas like barrier islands. Massachusetts' Executive Order on Barrier Beach Protection, which precedes the CBRA by over 2 years, limits

State expenditures for growth-inducing infrastructure in hazardous barrier beach areas and gives priority to acquisition of these areas.

Fourth, several States have undertaken special projects concerning barrier islands. For example, Louisiana has established a special fund to combat critical erosion of its barrier islands. Delaware mapped its barrier beaches and, as a result, established a setback line on which new regulations for managing beaches and dunes were based. Florida is preparing comprehensive regional evacuation and property loss reduction plans for its entire coast.

The policies and enforcement mechanisms of States with federally approved CZM programs are important factors in the protection of undeveloped coastal barrier resources. By integrating these programs into any conservation efforts, the Federal Government can build on what the States have already done and avoid unnecessarily conflicting policies or redundant regulations.

The purposes of the Coastal Zone Management Act are complementary to, and fully consistent with, the purposes of the CBRA. The CBRA does not interfere with the coastal zone management projects of State or local governments as long as those projects are consistent with the purposes of the CBRA. Even if an apparent conflict arose, because the CBRA only removes Federal subsidies for development, State-sponsored development could proceed if it were consistent with the coastal zone management program of that State.

CHAPTER 7

ACQUISITION ON COASTAL BARRIERS

The Federal Government did not originally own as much land on the coast as it did in other areas of the country. For a short time, the coasts of Florida, Alabama, Mississippi, and Louisiana were federally owned, but these were transferred to the States or private parties by the mid-1800's (Platt 1985). Federal interest did not turn towards conservation and preservation of coastal resources until the Cape Hatteras National Seashore was established in 1937 (U.S. Department of the Interior 1983). As steward of the Nation's natural and cultural resources, the DOI has a long-standing interest in and responsibility for these coastlines. Today, the National Park Service administers nine National Seashores along the Atlantic and gulf shorelines, encompassing about 550 shoreline miles and 400,000 acres of land. The Fish and Wildlife Service (FWS) manages about 50 National Wildlife Refuges along these coastlines.

During the last 3 decades, public awareness of the diverse National benefits associated with natural coastal barrier ecosystems has increased, resulting in a greater commitment to conservation of undeveloped areas. This trend parallels the proliferation of development, predominantly residential, that reflects the desire of an increasingly affluent population to use these resources for personal enjoyment. The result has been a progressive commitment of vast expanses of coastal barrier open space to long-term public and private uses.

Before World War II, more than 90% of the Nation's coastal barrier real estate existed as undeveloped natural areas, largely inaccessible to the general public. Post-war development soon began to change this situation, but not until 1961--when the Cape Cod National Seashore was authorized as the second National Seashore--did Congress begin to take aggressive action to protect large tracts of coastal barriers. From 1961 through 1972, Congress established eight new coastal barrier units of the National Park System, with a combined total of 468,131 acres. During the same 12-year period, the FWS established 12 new National Wildlife Refuges totaling 205,910 acres, and the network of State and local parks expanded substantially. Although primarily established to provide beaches for recreation, the State and local parks often included substantial areas of dunes and wetlands that were effectively conserved as undeveloped open space. Acquisition programs, particularly in the private sector and coastal states, have accelerated in recent years as competition for remaining undeveloped acreage has intensified. Since 1972, the National Park Service (NPS) has also continued to add acreage to its nine

National Seashores, and the FWS has acquired several new parcels of land on coastal barriers for the National Wildlife Refuge (NWR) System.

Since enactment of the CBRA, several CBRS units have been acquired for recreational or conservation purposes, including Shackleford Banks (NPS-Cape Lookout National Seashore), part of Mobile Point (FWS-Bon Secour NWR), and several areas in Florida (for inclusion in the State's park system). Acquisition, however, has been limited because of the excessive costs of acquiring prime beach real estate. It is pursued on a case-by-case basis as determined necessary by individual land-managing agencies.

THE LAND AND WATER CONSERVATION FUND

Funding for Federal land acquisition by the National Park Service, Fish and Wildlife Service, Bureau of Land Management, and the Forest Service, is derived primarily from the Land and Water Conservation Fund (LWCF). Under the administration of the National Park Service, the LWCF also provides funding for a State assistance program with 50-50 matching grants for the acquisition and development of outdoor recreation areas and facilities. The law authorizes deposits to the Fund of $900 million per year through September 30, 1989. All monies coming into the Fund remain available for appropriation in subsequent years. Not less than 40% of actual appropriations in any given year must be used for Federal land acquisition. Since 1982, Congress has specified use of Federal land acquisition monies on a site-by-site basis. Funds appropriated from the LWCF are without fiscal year limitation and remain available until expended.

LWCF funds come from recreation fees collected by the National Park Service, Forest Service, Bureau of Land Management, and the Fish and Wildlife Service; net proceeds of surplus Federal real property sales to non-Federal entities; and motorboat fuel taxes not to exceed $1 million. Any difference between the sum of these deposits and $900 million is provided by deposits of Outer Continental Shelf (OCS) oil revenues. About 82% of all deposits for the 21-year life of the Fund have come from OCS revenues.

THE NATIONAL WILDLIFE REFUGE SYSTEM

In 1903, President Theodore Roosevelt signed an executive order protecting pelicans, egrets, herons and other birds on Florida's Pelican Island from capture for the millinery trade. This made Pelican Island, located behind a coastal barrier and composing part of a coastal barrier ecosystem, the first National Wildlife Refuge. Today over 400 refuges, encompassing nearly 90 million acres in 49 states and 5 territories make up the refuge system. They range in size from less than an acre to nearly 20 million acres. About 50 National Wildlife Refuges are located, at least in part, in coastal barrier ecosystems on the Atlantic and gulf coasts.

The FWS undertakes land acquisition using two major sources of funding: the Migratory Bird Conservation Fund (MBCF) and the Land and Water Conservation

Fund. The Service also acquires land by donation, exchange, and through excess Federal property procedures.

The MBCF is principally composed of revenues from the sale of Migratory Bird Hunting and Conservation Stamps (duck stamps) and advance appropriations against future duck stamp sales authorized by the Wetlands Loan Act of 1961. Duck stamps must be purchased annually by all individuals hunting migratory water birds. The MBCF has historically been the backbone of FWS acquisition efforts and is reserved for the acquisition of waterfowl habitat in two programs. The first of these involves the purchase of major refuges for migratory birds carried out under the authority of the Migratory Bird Conservation Commission, comprised of the Secretaries of the Interior, Agriculture, and Transportation, and two members of Congress appointed from both the House and Senate. The second involves the acquisition of waterfowl production areas (small natural wetlands located mainly in the pothole region of the upper Midwest) which are essential as breeding habitat for waterfowl. To determine acquisition priorities for the MBCF, the Service has identified nine waterfowl species of special emphasis. The resource needs of these species have been translated into habitat categories, with primary emphasis placed on nesting habitat in the prairie potholes and wintering habitat in the Central Valley of California, the Mississippi Delta bottomland hardwoods, and along the Atlantic and gulf coasts. Lands for possible acquisition are reviewed by determining their importance in meeting these identified needs, the threat of conversion to other uses, and the availability of the land for sale.

To illustrate, the FWS was involved in an acquisition project to protect a coastal barrier using the MBCF on Currituck Banks in North Carolina. On August 2, 1983, the Migratory Bird Conservation Commission approved establishment of the Currituck National Wildlife Refuge to preserve an important segment of wintering habitat for the black duck. Here, the barrier beach protects marsh that not only provides valuable habitat for waterfowl, but also serves as a nursery for almost 50 species of fish and a home for many other marsh and estuarine animals. This newly approved refuge includes part of the Currituck Banks CBRS unit (L01).

The FWS is authorized to use the Land and Water Conservation Fund in support of a number of established Service program objectives. Land acquisition can be an important recovery tool for species federally listed as endangered or threatened because a majority of them have declined in numbers as a result of habitat degradation or loss. Section 5 of the Endangered Species Act gives the Secretary of the Interior authority to acquire lands and water to conserve endangered or threatened species. The FWS considers acquisition if a species recovery plan suggests habitat protection as a recovery measure and alternative protection strategies are not feasible.

The Fish and Wildlife Act of 1956 authorizes the Secretary of the Interior to acquire refuge lands to assure the perpetuation of remaining examples of nationally significant habitats. For instance, in fiscal year 1985, FWS acquired some of the last remnants of native brushland habitat in the Lower Rio Grande Valley, Texas. In an example more to the point of this report, Bon Secour NWR, located in a coastal barrier system in Alabama, was originally

identified under this program and subsequently received special Congressional authorization in 1980. Part of this acquisition is within the CBRS (Q01, Mobile Point).

The Refuge Recreation Act of 1962 authorizes the FWS to acquire habitat that also may be used for fish- and wildlife-oriented education, interpretation, or recreation. For example, the Service has acquired properties adjacent to existing refuges to provide access where it might not otherwise be available for public use programs.

The Emergency Wetlands Resources Act of 1986 (Public Law 99-645) provides additional mechanisms for Federal acquisition of wetlands to augment the NWR system. One provision of this law authorized entrance fees at some refuges with 70% of the receipts collected dedicated to the Migratory Bird Conservation Fund for the purchase of migratory bird habitat. A second provision authorized an increase in the price of Federal duck stamps that is to be used to acquire wetlands. Both these provisions employ the user-fee concept to finance wetland acquisition. Other provisions of the Emergency Wetlands Resources Act allow the monies appropriated under the Land and Water Conservation Fund to be used for Federal wetland purchases and for State acquisition under the related State grant program. The FWS has developed a National Wetlands Priority Conservation Plan that identifies the locations and types of wetlands that should receive priority attention for Federal and State wetland acquisition projects.

Finally, the Land and Water Conservation Fund Act also authorizes appropriations for refuges established by special legislation. For example, on October 26, 1984, the President signed Public Law 98-584, which authorized the establishment of the Connecticut Coastal National Wildlife Refuge over four sites along the Connecticut Coast. This refuge provides nesting habitat for the roseate tern and the threatened piping plover. In addition, the refuge provides wintering habitat for brant and black ducks, both species of special concern to FWS. With the exception of Falkner Island (currently owned by the Coast Guard), all of the sites designated for inclusion in the refuge are in the CBRS. In this instance, however, Congress believed that the CBRA would not provide adequate protection against development pressures in the densely populated Northeast, and that additional management actions not afforded by the CBRA would be necessary to protect and enhance the wildlife resources. In this case, competition between the gull populations and the shorebirds of concern needed to be evaluated and controlled. Management of barrier use has been necessary to prevent adverse impacts on threatened beach-nesting birds.

The FWS funding priority under LWCF has generally been given to areas which support endangered species and to specially legislated areas, in each case taking into account the threat to the habitat and the availability of the property. In addition, basic FWS policy is to acquire land only when other means of achieving program goals and objectives are not appropriate, available, or effective. When lands are to be acquired, the minimum interest necessary to reach management objectives is acquired and full consideration is given to extended use reservations, exchanges, or other alternatives that will lessen the impact on the owner. To carry out this land acquisition policy, a

land protection plan is developed with public participation to consider, among other factors, the socio-cultural impacts of acquisition.

The North American Waterfowl Management Plan, signed by the United States and Canada on May 14, 1988, provides a framework for waterfowl management and conservation efforts in the United States and Canada through the year 2000. The Plan sets goals for waterfowl populations, identifies habitat conservation needs in specific regions, and recommends measures for resolving problems of international concern. Habitat conservation efforts are targeted to the central Gulf of Mexico and mid-Atlantic coasts, among other areas. The efforts will include the initiation of intensive management on both public and private lands and some acquisition of properties of extraordinary value as waterfowl habitat for refuges.

In summary, unless a refuge is specifically authorized by Congress, FWS acquires land only in support of specific program objectives and priorities, and according to specific statutory authorities. While donations are encouraged, the FWS can accept them only in support of existing programs because of the management costs and needed efficiencies. (FWS acquisition of excess Federal property is discussed in the next section of this chapter.) For areas identified as priorities in meeting program objectives, inclusion in the CBRS will be considered in determining threat to the habitat. To the extent that the elimination of Federal assistance by the CBRA is expected to encourage habitat conservation, habitat within a designated unit might be considered less vulnerable than habitat not designated and therefore given a lower acquisition priority. There may be some situations, however, such as the Connecticut Coastal NWR situation, where additional protection or management measures are required to conserve targeted natural resources.

Although several commenters suggested that Congress appropriate additional monies for purchasing CBRS lands, any evaluation of acquisition as a possible management tool must include a consideration of overall budgetary constraints. Annual revenues to the MBCF from duck stamp sales currently average approximately $15 million per year; however, there is a backlog of Commission-approved projects.

STATE AND LOCAL ACQUISITION

Clearly, acquisition of coastal barrier land by State and local governments is also a conservation alternative for the CBRS. Much of the 4,164,844 acres identified in the 1985 draft coastal barrier inventory as "otherwise protected" was managed by State and local governments. All States have some sort of land acquisition program. Some States are aggressively focusing their acquisition programs on critical coastal habitat. For example, Florida's "Save Our Coast" program represents a State-wide effort to protect and preserve coastal resources.

Many undeveloped coastal barriers could benefit from State or local management in coordination with zoning or regulatory activities critical to conservation of coastal resources, such as fish and game management. Decisions relating to

post-storm redevelopment generally occur at the State level and provide another opportunity for conservation of coastal barriers.

SURPLUS OR EXCESS FEDERAL PROPERTY

There are considerable Federal holdings on Atlantic and gulf coastal barriers not included in the CBRS. The CBRA does not address surplus or excess property transfer of lands held by Federal agencies. These lands could be used for development if transferred to private ownership without appropriate safeguards.

The disposal process for excess and surplus Federal properties is spelled out in the Federal Property Management Regulations (FPMR), part 101-47, as issued by the General Services Administration (GSA), Federal Property Resources Service. Basically, when a Federal agency determines it holds property that is no longer needed, it reports the property excess to GSA, which in turn issues an excess property notice describing the available excess property. This notice is transmitted to every Federal agency to determine the Federal interest in acquiring the property. If any Federal agency is interested, a statement justifying the agency's interest in the property is prepared and submitted to GSA. GSA evaluates the request and, if a legitimate Federal need is established, the property is transferred to the requesting Federal agency, which reimburses the Treasury for the property's fair market value.

The transfer of excess properties between Federal agencies at fair market value is in accordance with FPMR Section 101-47.203-7. However, the agency interested in acquiring an excess Federal property can request transfer of the property without reimbursement at fair market value by asking GSA for a waiver of the requirement. In such cases, the request will be submitted by GSA to the Director, Office of Management and Budget, for approval.

If no Federal agency expresses an interest to GSA in an excess Federal property, the property becomes surplus to Federal needs and is made available to States, counties, cities and certain nonprofit institutions. Federal surplus properties can be acquired by these entities for such public uses as parks and recreation areas, airports, schools, health facilities, or wildlife conservation areas at discounts or for no payment if the proposed use of the property represents its "highest and best" use. Properties so transferred are restricted by the terms of the deed for the particular public use involved. Properties not donated may be acquired by public organizations for unrestricted uses upon payment of the estimated fair market value for unrestricted use. In the event that the property is not acquired for public purposes it is offered for sale to the general public by competitive bid.

The FWS, which is specifically mentioned by the CBRA as playing a role in protecting coastal barriers as a part of its programs, may apply for excess Federal property under one of two laws.

1. Public Law 98-537 (16 U.S.C. 667d), as amended: This statute states that when the Administrator of GSA determines that real property is no longer needed by a Federal agency, it can be transferred to the Secretary of the

Interior without reimbursement if the land has particular value for migratory birds. Under this same law, surplus property may be transferred to the States, also at no cost, if the land has value for wildlife other than migratory birds.

2. Federal Property and Administrative Service Act of 1949 (40 U.S.C. 471-535), as amended: This is the basic authority for the transfer of excess Federal land to other Federal agencies and is used by the DOI to apply for property for other FWS programs. If the transfer is to be requested without reimbursement, a certificate that no funds are available, or that funds would have to be diverted from other programs and approval of OMB must be obtained.

In keeping with the Administrative policy of reducing Federal spending and encouraging the optimum use of Federal real property, the GSA has published regulations requiring 100% reimbursement on the transfer of excess properties to Federal agencies. In determining those areas that may be forwarded to GSA for exception to the reimbursement requirement, the DOI policy gives priority to coastal barriers.

Cape Charles National Wildlife Refuge, Virginia, is an example of an area recently transferred at no cost to the FWS under Public Law 98-537. This former Air Force parcel located on the Atlantic coast is of value to migratory birds, contains habitat that supports endangered species, augments existing National Wildlife Refuges, and is part of a larger study area delineated by the FWS for possible acquisition from private parties.

Commenters have suggested that GSA notify prospective buyers when coastal barrier property is declared surplus that it has been included in the CBRS and that it is subject to restrictions on future Federal funding. Deed restrictions could be placed by GSA on any transfer of coastal barrier property, similar to the restrictions that may be placed on wetlands declared surplus Federal property. Such restrictions on coastal barrier property could reinforce the goals of the CBRA and ensure that the Federal Government does not encourage development of coastal barriers through its excess property procedures. This concept could be applied to all Federal property on coastal barriers, both in and out of the CBRS. However, these restrictions would have to be authorized by special legislation or executive order.

The public comments received on acquisition alternatives are summarized in Table 13. The States of Massachusetts, New York, Delaware, Alabama, and Mississippi all support a user-fee approach to acquisition. Massachusetts, New York, and Mississippi also support the inclusion of excess Federal property on undeveloped coastal barriers in the CBRS prior to disposal.

RECOMMENDATIONS

The DOI recommends that the Federal Government continue to employ the user-fee concept in acquisition of CBRS lands as appropriate. The DOI also recommends that State and local land-managing agencies as well as private conservation

organizations be encouraged to pursue acquisition of CBRS lands as appropriate. If any CBRS lands become "otherwise protected" areas, the DOI recommends that they automatically be deleted from the CBRS and exempt from the CBRA's restrictions.

The DOI also recommends an amendment to the CBRA to require that if any Federal coastal barrier properties are determined to be excess or surplus to government needs, the undeveloped portions of such properties which the General Service Administration, in consultation with the DOI, determines are appropriate for inclusion in the CBRS be automatically included in the CBRS prior to disposal unless they will otherwise qualify for exemption under the CBRA or qualify as otherwise protected areas.

Table 13. Summary of public comments received on acquisition, regulatory, and tax law amendments. More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	Use User-fees for Acquisition as Appropriate		Add Surplus/ Excess Federal Barriers to CBRS		No Regulatory Amendments		No Tax Law Amendments	
	For	Against	For	Against	For	Against	For	Against
California	1	0	0	0	0	0	1	0
Dist. of Columbia	1	0	3	0	2	5	2	0
Florida	2	0	3	0	1	2	0	0
Maryland	0	0	0	0	0	0	0	1
Massachusetts	0	0	1	0	0	0	0	0
Ohio	1	0	0	0	0	1	0	0
Pennsylvania	1	0	0	0	1	0	0	0
Texas	2	0	1	0	0	2	2	0
Virginia	0	0	0	0	0	1	0	0
	8	0	8	0	4	11	5	1

CHAPTER 8

REGULATORY PROGRAMS ON COASTAL BARRIERS

FEDERAL REGULATORY AUTHORITY

Regulatory programs, another important aspect of Federal authority and intervention, are neither included nor addressed in the CBRA. Several Federal agencies, including the U.S. Army Corps of Engineers, the Environmental Protection Agency (EPA), and the U.S. Coast Guard administer regulatory programs that affect coastal barriers and their associated natural resources. Other regulatory requirements, such as those imposed by Executive Order 11988, Floodplain Management (May 24, 1977), apply to actions undertaken by any Federal agency. All of these programs have the potential for limiting or modifying development on coastal barriers.

Section 9 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 401) prohibits the construction of any bridge, dam, dike, or causeway over or in any navigable water of the United States without approval of the plans by the Army Corps of Engineers, and without the consent of Congress. This approval process is administered by the Army Corps of Engineers, except that authority for bridges and causeways was transferred to the Coast Guard by Section 6(g)(6)(A) of the Department of Transportation Act, (49 U.S.C. 1655(g)(6)(A)). Section 10 of the Rivers and Harbors Act, (33 U.S.C. 403) prohibits the obstruction or alteration of any navigable water of the United States unless the work is recommended by the Corps of Engineers and approved by the Secretary of the Army. Covered activities include construction of any structure in or over any navigable water of the United States, the excavation from, or depositing of, material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters.

Section 404 of the Federal Water Pollution Control Act (Clean Water Act) (33 U.S.C. 1344) authorizes the Corps of Engineers to issue permits for the discharge of dredged or fill material into U.S. waters. The selection and use of disposal sites must, pursuant to Section 404(b)(1), be in accordance with guidelines developed by the EPA in conjunction with the Corps of Engineers. These guidelines are published in the Code of Federal Regulations (40 CFR, part 230) and are generally designed to avoid unacceptable adverse impacts on aquatic ecosystems and degradation or destruction of special aquatic sites. If the selection or use of a proposed disposal site would be prohibited by the guidelines, the Corps of Engineers shall, in addition, consider the economic impact on navigation of such a prohibition. The EPA may prohibit or restrict the use of an area as a disposal site if such use would have an unacceptable

adverse effect on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas.

Sections 401 and 402 of the Clean Water Act (33 U.S.C. 1341 and 1342) are administered by the EPA. Section 401 requires that Federal licenses or permits for activities involving any discharge into navigable waters may not be granted unless the State in which the discharge would originate certifies that the discharge will meet the applicable effluent limitation or other applicable limitation or standard. Section 402 establishes the National Pollutant Discharge Elimination System, under which permits are required for the discharge of any pollutant or combination of pollutants. Such permits may be issued only upon the condition that the discharge will meet the applicable effluent limitation or other limitation or standard established under the Clean Water Act. Authority to issue Section 402 permits has, in most cases, been transferred to the States.

Executive Order 11988, Floodplain Management, requires Federal agencies proposing to support or allow an activity that will be located in a floodplain to consider alternatives that would avoid adverse effects and incompatible development in the floodplain. An agency may, however, approve or support an activity in a floodplain if that is the only practicable alternative and if the activity is modified to minimize potential harm to or within the floodplain. Executive Order 11990, Protection of Wetlands, directs Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practicable alternative to such construction and harm to wetlands from the construction is minimized to the extent practicable. In carrying out this responsibility, agencies must consider public health, safety, and welfare, maintenance of natural systems, and other uses of wetlands in the public interest.

All of these regulatory programs have the potential to limit, modify, and even prevent development of coastal barriers. For instance, these programs require permits for the construction of causeways, bridges, and docks, which may be the means of access to coastal barriers that are physically isolated. Permits are also required for many components of the infrastructure necessary for development, such as utility crossings and wastewater discharges.

Since the passage of the CBRA in October 1982, many Federal permits for various types of construction activities on or adjacent to coastal barriers in the CBRS have been issued. While these permits have authorized a number of different types of structures and activities, the greatest number have been issued for the construction of individual boat docks or marinas. The effects of these structures and their use on coastal barrier resources and the extent to which these effects can be considered during the permit application evaluation process, illuminate the effect of Federal regulatory programs on coastal barriers.

Boat docks on or adjacent to coastal barriers are frequently associated with the construction of condominium complexes, and are often viewed as essential to the overall success of this type of development. Marinas usually require a combination of dredging, filling, and constructing bulkheads and thus require a Section 404 permit.

Dredging is required to provide adequate water depth so that boats may have access to the docks. Dredging, however, especially in shallow waters, can have significant adverse effects on natural resources. As discussed previously, the shallow waters found landward of the coastal barrier system, particularly those of the estuaries, embayments, and lagoons, are essential for the continued viability of the commercial and recreational fishing industries. When these areas are filled for buildings or dredged for navigation, biological productivity is greatly reduced or destroyed.

The construction of bulkheads on the shoreline is often accompanied by back-filling to provide space for parking, boathouses, restaurants, and other development. This eliminates the habitat value of the filled areas. The proliferation of small boats that accompanies dock construction can also create problems. For instance, marinas may not have facilities for pumping-out wastes from boats, or provisions for the disposal of boat waste oil in the vicinity of the marinas. In some areas the boats themselves can be a threat to wildlife; the endangered manatee has suffered injuries and mortalities from boat propellers. In addition, bulkheads are vertical, relatively smooth surfaces that reflect, rather than absorb, wave energy. The reflected energy, whether generated by wind or boat wake, often passes along the shoreline onto adjacent unprotected shoreline areas, thereby increasing their erosion rate. Moreover, depending on the type of bottom, the natural vegetation may be uprooted. Frequently, the installation of an individual bulkhead results in the eventual bulkheading of extensive reaches of shoreline with further potential for adverse natural resource impacts.

In our review, several issues have emerged concerning the future effects of activities requiring Federal permits on coastal barriers. The first important issue involves the scope of the Army Corps of Engineers' jurisdiction under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The jurisdiction of the Corps under Section 10 of the Rivers and Harbors Act is limited to "navigable waters of the United States," which is defined in 33 CFR 322.2(a) and 33 CFR 329 generally to include waters subject to the ebb and flow of the tide shoreward to the mean high water mark and/or waters used, presently or in the past, or susceptible to use for transportation in interstate or foreign commerce. The jurisdiction of the Corps under Section 404 of the Clean Water Act is limited to "navigable waters," which is defined in turn by Section 502(7) of the Act, (33 U.S.C. 1362 (7)), as "waters of the United States." As interpreted by the courts and implemented by the Corps in 33 CFR 323, the scope of the Corps' jurisdiction under Section 404 is significantly broader than that under Section 10 of the Rivers and Harbors Act. It includes, for instance:

1. interstate wetlands (33 CFR 323.2(a)(2));

2. "all other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce," (33 CFR 323.2(a)(3)), and

3. wetlands adjacent to waters of the United States (33 CFR 323.2(a)(7)).

Because wetlands are defined generally to include swamps, marshes, bogs, and similar areas, and adjacent wetlands are defined to include "wetlands separated from other waters of the United States by artificial dikes or barriers, natural river berms, beach dunes and the like," the Corps' Section 404 jurisdiction might be interpreted to include wetlands behind and among the dunes on coastal barriers. The Corps, however, has not generally asserted Section 404 jurisdiction over such coastal barrier wetlands. The general position of the Corps on this issue has been that wetlands under its jurisdiction must be used by interstate or foreign travelers for recreational or other purposes or be the source of fish or shellfish taken and sold or used in interstate commerce. This interpretation of the Corps' jurisdiction over wetlands means that Section 404 permits are not always required for the dredging or filling of wetlands among and behind dunes on coastal barriers.

The extent to which the Corps asserts jurisdiction under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act is particularly important because of the general policies adopted by the Corps for evaluating applications for permits. The policies require attention to public interest issues such as flood hazards, recreation, water quality, and safety, and require particular attention to wetlands and fish and wildlife concerns (see 33 CFR 320.4). The Corps also consults with other Federal agencies such as the Fish and Wildlife Service and the National Marine Fisheries Service--agencies with fish and wildlife conservation missions--with respect to permit applications. The Corps' regulatory program thus requires consideration of two of the main purposes of the CBRA--protection of human safety and protection of fish and wildlife and other natural resources--when any permit under the jurisdiction of the Corps is evaluated. To the extent, then, that the Corps interprets its jurisdiction as extending to coastal barriers, those areas may receive protection under the Corps' regulatory programs that would complement that provided by the CBRA.

As noted previously, the Corps of Engineers, in reviewing a Section 404 dredge and fill permit application, uses the Section 404(b)(1) guidelines promulgated by EPA at 33 CFR Part 230 and its own policies set forth at 33 CFR 320.4. The Corps' wetlands policy, for example, generally prohibits issuance of a permit for an activity that would involve alteration of wetlands unless the Corps determines that the benefits of the proposed alteration outweigh the damage to the wetland resource (33 CFR 320.4(b)(4)). The manner in which this analysis is performed can have a significant impact on the usefulness of the permit evaluation process in protecting coastal barrier resources. Of particular importance are the identification and valuation of the costs (both environmental and economic) of altering the wetlands, and the extent to which the benefits calculation considers the indirect costs that may be involved.

The wetlands permit evaluation policy also requires attention to the cumulative effects of numerous individual alterations of wetlands, because "the cumulative effect of numerous such piecemeal changes often results in a major impairment of the wetland resource" (33 CFR 320.4(b)(3)). The requirement to consider the cumulative effects of individual activities clearly has the potential for ensuring comprehensive protection of the wetlands resources of coastal barriers from the adverse effects of activities subject to Section 404. Methods to assess cumulative impacts, however, are

only now being developed, and the Congressional Office of Technology Assessment (1984) has reported that Section 404 permits for activities in wetlands are rarely denied unless substantial individual impacts are shown.

Executive Order 11988, Floodplain Management, also potentially ensures that Federal agencies will no longer support or allow activities within flood-prone areas, such as coastal barriers, where there are practicable alternatives. Most Federal agencies have issued regulations that implement the requirements of the Executive Order. The OTA wetlands report indicates, however, that these regulations have had little detectable effect on the issuance of Federal permits for activities on or adjacent to coastal barriers.

Federal regulatory programs cover activities on and adjacent to coastal barriers. As discussed above, whether these programs cover all parts of coastal barriers, such as wetlands with no clear connection with interstate or foreign commerce, is questionable. Moreover, while all these programs require consideration of the impacts of proposed activities on such natural resources as wetlands and fish and wildlife, none require specific consideration of whether the CBRA purposes--minimization of loss of human life, wasteful expenditures of Federal funds, and damage to fish, wildlife, and other natural resources associated with coastal barriers--will be met.

It has been suggested that legislation to require Federal agencies to consider whether the CBRA purposes will be met before issuing permits for activities on or adjacent to coastal barriers could help ensure that permits are only issued for activities that are consistent with the CBRA purposes. The legislation could require that no such permit shall be issued unless the permitting agency first finds that the proposed activity would be consistent with the purposes of the CBRA. An alternative formulation would be to impose a balancing test similar to that in the Corps of Engineers wetlands permit evaluation policy under which the permit could be issued despite inconsistency with the CBRA purposes if warranted by the benefits to be derived from the proposed activity. Still another alternative would be simply to require explicit consideration of the CBRA purposes before issuance of the permit. To each alternative could be added the requirement that the Federal permitting agency consult with the Fish and Wildlife Service before issuing the permit, a role that the Service has already assumed regarding exceptions to the prohibition on Federal expenditures under Section 6 of the CBRA.

A Federal application fee could also be imposed upon anyone seeking Federal permission to dredge or fill any wetland area within or adjacent to a CBRS unit. This charge could represent a percentage of the estimated enhancement in value that would occur should the permission be granted. Funds collected could be provided for land acquisition to the agency most capable of acquiring and managing those lands determined to be under immediate threat of development within a unit of the System. This program could be modeled after the local land transfer tax system that has recently been adopted in five eastern States. Several communities in Massachusetts and New York have addressed the problem of protecting coastal and recreation areas by buying and maintaining undeveloped land with the revenue from a tax on real estate transfers. This is in essence the same approach as the fee option.

Conservation without creation of a new Federal regulatory program, however, was one of the major tenets of the CBRA. In signing the CBRA, President Reagan stated "the Coastal Barrier Resources Act meets a National problem with less Federal involvement, not more." Although many Federal permits for various types of construction activities on or adjacent to the CBRS have been issued since the passage of the CBRA in 1982, none of these permits indicates a direct disregard for the purposes of the CBRA.

The U.S. Army Corps of Engineers opposes any CBRA amendment requiring regulatory consistency, stating that the Corps of Engineers permitting process adequately accommodates the CBRA purposes. The Environmental Protection Agency supports an amendment requiring consistency and states that requiring existing Federal permitting programs to be administered consistently with the CBRA would not involve an increase in Federal regulatory involvement. The EPA also states that accounting for fish and wildlife values does not, by itself, make the permitting process consistent with the CBRA.

The public comments received on regulatory amendments are summarized in Table 13. The State of Connecticut recommends that the CBRA be amended to require Federal permits, licenses, and certifications to be withheld in the CBRS unless they are fully consistent with the purposes of the CBRA. The States of Massachusetts, New York, Delaware, Alabama, and Mississippi all believe that requiring regulatory consistency in the CBRS is unnecessary.

STATE REGULATORY PROGRAMS

A number of States, such as New Hampshire and Florida, have created a focus for coastal policies and actions through the networking of agencies and functions. Other States, such as Rhode Island, have created councils or agencies to specifically address and coordinate coastal actions. In 1971, Rhode Island created the Coastal Resources Management Council as the principal mechanism for management of the State's coastal zone. The Council has direct authority over the entire shoreline and those activities which will significantly affect the shore and tidal waters.

Most States have in place some sort of wetlands protection which also serves coastal barrier conservation. For example, in 1978, Massachusetts enacted the Wetlands Protection Act, specifically including barrier beaches and dunes within its jurisdiction. Many other acts designed to protect and regulate activities on the coast followed. This movement culminated on August 8, 1980, when the Governor issued Executive Order No. 181 on Barrier Beaches. This was the first order of its kind in the country and, in effect, created a State policy discouraging further government funding of new or old development on barrier beaches in the State. In 1981, the Governor also issued Executive Order 190--Regulation of Off-Road Vehicle Use on Public Lands Containing Coastal Wetland Resources--to exclude such vehicle use in sensitive environmental areas, specifically, dunes, salt marshes, and tidal flats, which support significant public interests.

Construction control lines are another way State governments conserve coastal barrier resources. The States of Florida and North Carolina, for instance,

have established limits that are based on data such as longshore drift rates, 100-year storm surge levels, and elevations. These limits are not consistently reinforced at the local level. In some counties in Florida, however, the construction lines are more restrictive than the State limits.

An early act of some significance to Texas coastal dune protection was the 1970 decision to require permits from the county commissions for removal of sand, marl, gravel, and shell within 1,500 ft of any public beach. In 1973, the Texas State legislature passed the "Sand Dune Protection Act" which authorized those counties with jurisdiction over coastal barriers to establish a dune protection line 1,000 ft landward of the mean high tide line. Once a county has established such a dune protection line, a permit must be obtained from the county commission to disturb dunes or vegetation seaward of the line. If a dune area under consideration for some alteration is judged critical to the protection of State-owned lands, then the General Land Office may comment on the proposed activities. There is no required State permit, however, nor can the General Land Office comment if the county has not adopted a dune protection line. A unique approach to dune protection has been taken in Port Aransas, Texas, where the builders, together with the city and county governments and the local water district, decided to impose deed restrictions against development in the first row of unstabilized dunes. The restrictions also prohibit seawall or bulkhead construction.

Regulations pertaining to post-storm construction provide another alternative for conservation. In New York, the Coastal Erosion Hazards Act has provided both set-back requirements and reconstruction policies for areas defined as coastal erosion hazard areas. In these locations, no new development may occur and, further, no redevelopment may occur if more than 50% of a structure in these areas is destroyed by a storm. On Fire Island, the local communities, in cooperation with the National Park Service, have implemented zoning regulations that make it impossible to rebuild in front of the primary dune line.

RECOMMENDATIONS

The DOI finds that the major Federal permit programs that affect the CBRS--permits for dredge and fill and for bridge construction--take fish and wildlife values into account. Requiring regulatory consistency at the Federal level would depart from the basic CBRA premise that conservation can be achieved without increasing Federal regulatory involvement by simply withdrawing Federal financial support for development of undeveloped coastal barriers. Furthermore, most States have additional regulatory safeguards that also serve the purposes of the CBRA. These include wetland protection programs, construction setback requirements, and post-storm reconstruction policies to control development on barriers. Therefore, the DOI recommends no regulatory amendment.

CHAPTER 9

TAX POLICY ON COASTAL BARRIERS

INTRODUCTION

The Coastal Barrier Resources Act withdrew most direct Federal financial assistance for development in the CBRS. However, direct Federal financial assistance (funding for roads, bridges, causeways, water systems, wastewater treatment, shore protection, etc.) has not generally subsidized the initial stages of coastal barrier development. Historically, most initial coastal barrier development has been financed through private sources and tax-exempt State or local debt instruments. As a matter of policy and law, direct Federal assistance becomes most available at later stages of development.

The CBRA also speaks to withdrawal of "indirect financial assistance" for development in the CBRS. The language of the CBRA and its legislative history provide no specific guidance as to whether the term "indirect financial assistance" was intended to include tax provisions such as casualty loss, capital gains, depreciation, or mortgage or loan interest deductions under the Internal Revenue Code. Witnesses at the Congressional hearings on the CBRA noted that continuation of such tax treatment helps make ownership of coastal property an attractive investment. They suggested that Congress clarify its intent towards the tax system.

The U.S. income tax was enacted in 1913. It was originally imposed at low rates and applied to fewer than 400,000 individuals with very high incomes. The need to finance World War II and expanded nondefense expenditures turned the individual income tax into a levy paid by most Americans. In 1954, the Internal Revenue Code was enacted. While it was a relatively simple, economically neutral system, even then some tax analysts criticized the fact that certain activities were accorded preferential tax treatment. During the last three decades, there has been enormous erosion in the tax base as tax-exempt actions have increased. For example, until 1987, accelerated depreciation and deduction of interest combined to eliminate most taxes on income from debt-financed investments in real estate. Exclusions, itemized deductions, and deduction value of credits offset about 34% of personal income in 1982 as opposed to 18% in 1954 (U.S. Department of the Treasury 1984).

Exclusions and deductions meant that tax law, along with the market, had become a major force determining how economic resources were used. Over the years, the tax system has exerted a pervasive influence on the behavior of private decisionmakers. As stated in the Treasury Department's 1984 Report to the President:

> The United States income tax is not used simply to raise revenue. Instead it is used to subsidize a long list of economic activities through exclusions from income subject to tax, adjustments to income, business deductions unrelated to actual expenses, deferral of tax liability, deductions of personal consumption expenditures, tax credits and preferential tax rates. (U.S. Department of the Treasury 1984)

A tax policy that is neutral toward development decisions on coastal barriers could reduce impacts on the fish, wildlife, and other natural resources of the CBRS. Adjustment in Federal tax policy could result in conservation by allowing development in the CBRS to be based on market signals, unaltered by Tax Code provisions. Evidence is mounting that without creating a tax differential between economic development and conservation goals, without removal or restriction of tax preferences for real estate development, denial of direct Federal subsidies alone has little influence on initial economic decisions to develop the CBRS. Exclusions, credits, deductions, accelerated cost recovery, and other tax incentives heavily favor development over conservation. Tax incentives for conservation are relatively few and do not compete effectively with these incentives for development.

The Tax Code has been scrutinized as a possible approach for natural resource conservation for many years. It has not been successfully directed at the protection of any specific natural resource area for two fundamental reasons: the inconsistency of such protection with established tax policy and the lack of specifically identified and therefore quantifiable resources. Neither argument is applicable to the CBRS.

According to the Treasury Department:

> Most of the exclusions, adjustments, itemized deductions, and credits currently found in the income tax are not required for the accurate measurement of income or ability to pay taxes. Rather, they are simply subsidies for private activities that are administered through the tax system. (U.S. Department of the Treasury 1984)

The Treasury Department has stated that for the past seven decades they have resisted manipulation of the Tax Code for achieving social goals, no matter how worthwhile. It is not surprising therefore that the Treasury Department has been reluctant to support the use of tax policy for conservation purposes. Revenue generation is only one of several important objectives typically considered on any major tax policy issue; however, in recent years, policy implications of tax manipulation have become more obvious. An array of tax amendments have been proposed in Congress to address a variety of social and economic issues: Japanese auto imports, condominium conversions, revitalization of areas such as the South Bronx, and historic preservation.

Identification of natural areas worthy of Federal attention has been the second issue in applying tax policy to the conservation of important natural resources simply because it is technically and politically difficult to authorize protection of nonspecific areas. For example, without the creation of a strong identification process and the specific identification of areas

that would serve a conservation purpose, the existing program to encourage the donation of conservation easements has been frustrated. Without a definitive listing of those areas truly worthy of protection, abuse could offset the potential advantages.

THE TAX CODE AND COASTAL BARRIERS

This section provides a discussion of tax policy options for conservation that is based, in part, upon the array of possibilities previously considered by the Congress. The concepts discussed in this section could neutralize Tax Code provisions that have the effect of altering market signals and misallocating resources by encouraging the development and subsequent destruction of the CBRS units. The options have been grouped into two categories: tax options that could reduce incentives to develop coastal barriers and tax options that could increase incentives to conserve coastal barriers. A review of the dynamics of these options follows their presentation. This discussion concerns the manner in which these options could be applied; effective dates, grandfather provisions, sunset dates, and long-term versus short-term ownership questions all fall within this topic.

All of the following tax options were identified by the Coastal Barriers Study Group or suggested by reviewers of the first draft of this report in 1985, before the Tax Reform Act of 1986 was passed. All references to the Internal Revenue Code in this section refer to the Code as it existed in 1985. The impacts of the Tax Reform Act on these tax options is discussed later in this chapter.

Tax Options That Could Reduce the Incentive to Develop Coastal Barriers

1. Restrict the deductibility for casualty loss.

Under the Internal Revenue Code, all taxpayers, including owners of structures that are or may in the future be located on a CBRS unit, are authorized to deduct any loss from fire, storm, shipwreck, or from other casualty or theft sustained during the taxable year and not compensated by insurance or otherwise. The only limitation is that the aggregate amount of all such losses sustained by an individual is limited to the amount that exceeds 10% of the adjusted gross income of the individual (Section 165(c)(3) of the Internal Revenue Code).

Development connected with a trade or business (such as hotels) and development conducted as transactions for profit by corporations may be even greater in the CBRS than individual developments, and these developers may also take casualty loss deductions under Section 165(c)(1) and (2). Section 165(i) allows taxpayers to take certain disaster losses into account for the tax year immediately preceding the tax year in which the disaster occurred.

These provisions reduce the risk of financial loss for those who build in dangerous locations. Restricting these deductions for losses in CBRS units would increase the cost of locating development in the CBRS.

2. Restrict depreciation allowances.

The Accelerated Cost Recovery System (ACRS) was established by the Economic Recovery Tax Act of 1981 and generally governs depreciation allowances for tangible property placed in service after 1980. ACRS assigns all "recovery property" to a class with a specified recovery period and depreciation schedule. In general, recovery property is defined to include all depreciable property placed in service after 1980, except intangible property, property subject to amortization, and property for which the taxpayer properly elects a method of depreciation (such as the units of production method) that is not expressed in terms of years.

The pre-ACRS depreciation rules remain in effect for property placed in service by a taxpayer before 1981. In general, these rules allow taxpayers to recover an asset's original cost less salvage value over its estimated useful life. Taxpayers can elect from among several rates of recovery ranging from straight line to methods that are substantially accelerated. Certain taxpayers can elect to depreciate assets under a system employing prescribed industry-wide class lives, with additional rules for salvage values, retirement, repair deductions, and other matters (the ADR system) (U.S. Department of the Treasury 1984).

The ACRS is one of the principal tax shelters available to investors and owners of real property placed in service after 1980. Its provisions greatly enhance the internal rate of return, fuel the growth of tax shelters, and provide powerful incentive to develop. It makes possible the sheltering of an investor's unrelated income, defers tax liability, and encourages taxpayers to make otherwise uneconomic investments in order to obtain tax benefits.

ACRS recovery periods are not based on the economic useful life of assets as under pre-ACRS depreciation rules, and for real estate are significantly shorter than under prior law. ACRS uses accelerated depreciation schedules (for most real property with which one would be concerned in CBRS units, the schedules are based on the 175% declining-balance method, switching to the straight-line method at the most advantageous time). The costs of building components (e.g., air conditioning, electrical, and similar systems) are not separately recoverable over periods shorter than that of the building itself, as was the case under prior law.

The following modifications of elements of ACRS for properties in the CBRS would reduce the level of depreciation write-offs available:

a. apply only the straight-line method of depreciation,
b. continue to allow recovery of the full original cost,
c. permit the taxpayer to elect either a 35-or 45-year recovery period,
d. continue provisions not permitting component cost recovery over periods shorter than the building's recovery period,
e. increase minimum "at risk" investment requirements for CBRS properties from 10% of the adjusted basis of the property to 30%.

These provisions would cause the buildings in CBRS units to be depreciated at the annual rate of 2.9% (35-year election) or 2.2% (45-year election). Component cost recovery periods would be significantly increased over current ACRS law, and over prior law. If adopted, the provisions would effectively understate the allowance for CBRS properties' economic depreciation, would create a tax disincentive, and should impair capital formation for real property development on CBRS units. Increasing the minimum "at risk" investment requirements would decrease financing leverage and would significantly reduce the internal rate of return for investors, making CBRS development a less attractive investment opportunity.

In lieu of modifying ACRS for properties in CBRS, the application of ACRS to properties in the CBRS could be prohibited. Depreciation of property in the CBRS would then only be allowed according to the prior law (i.e. the ADR system applied to property placed in service before 1981). A further disincentive would be to permit only the straight-line method of depreciation for properties in the CBRS. For consistency and ease of administration, building component depreciation would also revert to the provisions of prior law. The effects of this action would be similar to those with ACRS modification discussed above; although slightly favoring component depreciation, rates would be less than that of the building. The idea of restricting depreciation allowances to promote wetlands preservation was first discussed in The First Nationwide Outdoor Recreation Plan in 1973 and was the subject of a legislative proposal in the same year (H.R. 5584).

3. Treat capital gains on sales or exchanges of structures in the CBRS as ordinary income.

Currently, gains or losses from the sale or exchange of capital assets held for more than six months (one year for assets acquired before June 23, 1984) are treated as long-term capital gains or losses. Long-term capital gains receive preferential tax treatment. For individuals and other noncorporate taxpayers, 60% of net capital gain is excluded from income, with the balance of 40% taxable at ordinary rates. Thus, a taxpayer in the maximum 50% tax bracket has a marginal tax rate on net capital gain of 20%. For corporations, the regular maximum tax rate of 46% is reduced to 28% on net capital gain if the tax computed using that rate is lower than the corporation's regular tax.

A capital asset is defined generally as property held by a taxpayer other than (1) inventory, stock in trade, or property held primarily for sale to customers in the ordinary course of the taxpayer's trade or business, (2) depreciable or real property used in the taxpayer's trade or business, (3) rights to literary or artistic works held by the creator of such works, or acquired from the creator in certain tax-free transactions, (4) accounts and notes receivable, and (5) certain publications of the government (U.S. Department of the Treasury 1984).

If the Internal Revenue Code were amended to require any gain on the sale of structures or facilities constructed (or reconstructed) on CBRS units after the passage of the CBRA to be treated as ordinary income, it would eliminate the use of the less costly capital gains tax rate, which in these situations would ordinarily be lower than the applicable income rates. This idea was

initially discussed in The First Nationwide Outdoor Recreation Plan with regard to wetlands preservation and was included in H.R. 5584 (1973).

4. Disallow deductibility for certain business expenses.

If a provision were developed to disallow a business expense deduction for any draining, dredging, or filling within a CBRS unit, based upon the premise that draining, dredging, and filling are inconsistent with the purposes of the CBRA, it would prevent a business from writing off the cost of such activities. Other tax recovery of such costs, such as capitalization and amortization of costs over a period of a year, could also be expressly prohibited.

A logical extension of this option would be to disallow deductibility of CBRS unit site preparation costs and other costs during the origination phase of development (i.e., from inception through the construction period, until the building is placed in service). Precedent is found in Internal Revenue Code Section 189, which requires amortization of real property construction period interest and taxes.

5. Restrict or deny deductibility on interest expenses.

Currently, interest expenses on loans to finance purchase of residential or investment property may be deducted. For noncorporate taxpayers, interest on debt to acquire or carry investment property is deductible to the extent of the sum of (a) $10,000, (b) "net investment income," and (c) certain deductions attributable to net-leased property. Amounts disallowed under this limitation for a taxable year are carried forward and treated as investment interest in the succeeding taxable year.

Conservation could be encouraged by denying any deduction of interest by individuals, corporations, partnerships, and other legal entities to finance purchase of residential, commercial, or business properties, or other transactions for profit on CBRS units. If adopted, such a measure would be an important factor in neutralizing Federal taxes in the development, financing, and operation of real property, trades, businesses, and other transactions for profit on CBRS units.

6. Disallow all investment tax credits applicable to property in the CBRS.

A business credit against tax is allowed under Section 38 of the Internal Revenue Code, limited to $25,000 carried forward as much as 15 years, and carried back 3 years. The business credit includes the investment tax credit determined under Internal Revenue Code Section 46: the sum of the regular percentage, energy percentage, and rehabilitation percentage of qualified investments. Property that qualifies for the investment credit is further defined under Sections 48 and 168 of the Code.

7. Allow interest on all State and local debt securities issued to support infrastructure and other development within the CBRS to be taxable.

Historically, the initial development of most coastal barriers has been financed privately, often assisted by tax-exempt State and local general obligation bonds and other financial obligations. The interest of State and local tax-exemptions is generally not included in gross income (IRC Section 103(a)), and special limitations are placed on tax-exempt industrial development bonds under IRC Section 103(b).

The exemption of interest on State and local debt securities from taxation stems from the doctrine of reciprocal tax exemption outlined by the Supreme Court in McCulloch v. Maryland, 4 Wheat. 316 (1819). It permits States and local governments to borrow at interest rates lower than other borrowers (e.g., the Federal government and private corporations), and has a particular appeal to investors in high marginal income tax brackets. In order to foster tourism and development, numerous States and coastal barrier communities have issued tax-exempt securities for bridges, causeways, roads, and other community infrastructure. Removal of the tax-exempt status of such securities within the CBRS could reduce the attractiveness of such securities and act as a disincentive to coastal barrier development.

8. Disallow the authority to expense certain depreciable business assets under Section 179 of the IRC for property used or in place in the CBRS.

Under Section 179 of the Code, the cost of certain defined property may be expensed in the year that it is placed in service, rather than being depreciated. Under 1985 law, the total cost of property that may be expensed is $5,000 through 1987, $7,500 in 1988-89, and $10,000 in 1990 or thereafter. Removal of the authority to expense such property used or in place within the CBRS would add to the economic disincentives to development within the System.

9. Apply the "at-risk" limitations of Section 465 of the IRC to real estate holdings and equipment leasing in the CBRS.

Under Internal Revenue Code Section 465, the amount of loss that an investor may deduct is limited to the amount of capital he or she actually has at risk, including cash and the basis of property contributed to the venture, funds borrowed for the venture for which the taxpayer is personally liable, and the value of other assets securing nonrecourse borrowing. Losses disallowed in a taxable year may be carried forward to the next year.

These limitations do not currently apply to real estate holdings or to limited equipment leasing by closely held corporations. Real estate and equipment leasing investors are thus allowed to offset taxable income with tax losses that are not matched by economic losses, guaranteeing an investor a return that may make an otherwise noneconomic investment feasible.

10. Amend the IRC to increase restrictions on the deductibility of hobby losses (Section 183) and vacation home expenses (Section 280A) for properties in the CBRS.

Under IRC Section 183, business or investment loss deductions may be unavailable if they are in connection with a business or transaction that the taxpayer engages in for personal satisfaction and without any profit motive.

Under "safe harbor" rules, if a profit is realized in 2 out of 5 consecutive years, the activity is presumed not to be a hobby.

Where a vacation home is used both for personal purposes and for rental income, expenses must be allocated between personal (nondeductible) and investment (deductible) uses. The provisions of both Internal Revenue Code Section 183 and Section 280A must be considered. Section 280A sets use limits on both rental uses and personal uses for determining the deductibility of expenses.

Many coastal barrier properties are acquired for investment and rental purposes as well as for personal use. Increased restrictions on the deductibility of expenses incurred on such properties within the CBRS would act as a disincentive to the owner-lessor.

Tax Options That Could Increase the Incentive to Conserve Coastal Barriers

11. Allow donation of Federal income tax refund.

Under this approach, Federal taxpayers would be offered the opportunity to donate all or a portion of their available Federal tax refunds for the Federal purchase of lands within a CBRS unit. These funds would then be provided to the agency most capable of acquiring and managing the particular lands in question. Priority could be given to the acquisition of lands under the greatest immediate threat with regard to the conservation of the fish, wildlife, and other natural resources of the CBRS. This program could be modeled after the State income tax refund contribution system adopted by the State of Colorado in 1978 for funding its nongame animal program. As of 1982, 17 States had passed similar legislation and others were actively considering it.

12. Allow tax exempt financing for CBRS protection purposes.

Presently, nonprofit conservation organizations have to obtain a revenue ruling from the Internal Revenue Service in order to use tax-exempt bonds to finance the acquisition of lands under the authority of the exempt activities portion of the industrial development bond section of the Internal Revenue Code (Section 103(b)(4)). This could be accomplished by amending IRC Section 103(b)(4) to provide for acquisition of real property within the designated units of the CBRS by any person as defined in IRC 103(b)(c). If this were done, it would eliminate the need for following the highly complicated and technical revenue ruling process, which can be expensive and cumbersome.

Tax-exempt financing for coastal barrier protection purposes would improve the natural resource capabilities of the not-for-profit conservation organizations and foster private initiatives. Private acquisition protection followed by limited resale could assist in the retirement of the bonds. While provision would result in a tax expenditure, Industrial Revenue Bonds presently represent a significant tax expenditure program that is not directed toward identified Federal objectives.

13. Permit deductions for maintenance of compatible uses on CBRS units.

The tax options discussed above generally assume that a present landowner on a CBRS unit will develop that land unless discouraged from doing so. This is not always the case. There are owners who wish to maintain uses compatible with conservation goals such as hunting camps, summer camp sites, natural areas, and the like. In some situations, however, a booming market, encouraged by the existing tax structure, will strongly encourage development. For instance, the cost of paying State and local property taxes often makes low-intensity, compatible uses economically infeasible. Once development begins to occur on a CBRS unit, the increase in the assessed value of similar property and the subsequent increased property taxes become a driving force toward further development.

Property taxes are imposed at the State and local levels, and a number of ideas exist to address the issue of economic neutrality at that level. The general emphasis has been to provide some means of avoiding these increasingly high property taxes for uses determined to be important by State and local governments, primarily conservation uses. There are at least three types of reduced assessments presently used by the various States to encourage conservation uses: (1) favorable assessments; (2) deferred taxation; and (3) restrictive agreements. From a CBRA or conservation perspective, the critical goal for State and local government programs is the assurance of permanent resource protection. Without very rigorous provisions for recapture of tax deductions together with a significant penalty or some form of continuing restrictions, these provisions may delay development but they will not avoid it.

Given permanent protection, however, there are a number of possibilities for using the Internal Revenue Code to reinforce State and local reduced assessment programs. For example, State and local governments that encourage maintenance of existing compatible uses through reduced property tax assessments, deferred taxation, restrictive agreement, or similar property tax measures, could be compensated for their revenue loss (a payment in lieu of taxes approach). Under this approach, recapture, together with a substantial penalty, could then be accomplished at the Federal level to ensure continuity of protection.

14. Permit deductions for restoration of CBRS features.

The conservation of the fish, wildlife, and other natural resources of the System inherently includes the conservation of the ecological and geomorphic processes of these areas as well. If a barrier were added to the CBRS by Congress following a major storm, tax deductions for restoration of natural features destroyed or damaged by the storm could be made available. Restoration plans should be subject to DOI approval, both to assure protection of units, and to aid administration of and ensure compliance with the tax provisions.

15. Preferential tax treatment on sales and exchanges.

In situations where a landowner is contemplating the sale or exchange of land located within a CBRS unit for the most favorable price and is not interested in making a tax-deductible gift, a number of tax options could be retained or

provided to encourage the landowner to sell the property to a conservation organization. While this tax-preferred approach would clearly continue or expand existing tax subsidies, it is included at this time as an option for discussion. There are two considerations: which conservation organizations could be targeted for preferential purchases and what incentives could be used to encourage such sales.

The most cautious and clearly the most expensive approach to the United States would be to encourage sales only to Federal agencies. Another approach would be to encourage sales or exchanges to State and local governments. A third alternative would be to provide these incentives to a landowner who sells to a qualified conservation organization, perhaps as defined in accordance with Section 6 of the Tax Treatment Extension Act of 1980 concerning the donation of property for conservation purposes. Several options which address this alternative follow.

a. Allow preferential tax treatment on capital gains on sales or exchanges.

There are several ways to modify existing capital gains taxes to promote sales and exchanges to conservation organizations for a conservation purpose. These include a complete nonrecognition of gain on the transaction, a deferral on the recognition of the gain and the payment of the tax, and a lowering of the maximum capital gain tax to be paid.

From a resource perspective, the strongest approach to encouraging sales for conservation purposes would be to eliminate the capital gains tax for sales or exchanges to qualified conservation organizations. Such an option could be patterned after the nonrecognition of gain provided for the sale of a residence by owners over age 55. An alternative would be to defer the payment of a capital gains tax if the owner reinvests the proceeds of the sale within 3 years or exchanges the property for other real property holdings. Such an exchange need not necessarily be for the same type (like kind) of property.

The maximum applicable capital gains tax on sales to conservation groups could also be lowered by changing the applicable percentage of the capital gains tax. Alternatively, the more favorable valuation rules with regard to estate taxes might be applied to these types of transactions. These provisions permit lands used in farming or closely held businesses to be valued for estate tax purposes at their actual use rather than their highest and best use (which would reflect their development value). Under this approach, a property with an existing use compatible with the conservation of a CBRS unit that is sold or exchanged to a conservation organization for a conservation purpose would be valued for capital gains tax purposes at its actual use value.

b. Preferential tax treatment on estate taxes.

The tax option applicable to sales and exchanges generally could also be applicable to a sale or exchange by an estate. Estates could be provided with these incentives to sell or exchange key natural areas for a conservation purpose. In addition, the existing requirement on estates to pay

estate taxes within 9 months of death could be modified when a sale for a conservation purpose was being negotiated. Some outside time limit would appear to be necessary.

c. Preferential tax treatment on settlements.

A final approach that could be developed regarding sales and exchanges concerns the settlement of actions with the United States. At the present time, the Federal Government has no authority to accept title to property on behalf of any Federal agency in the settlement of an action with a taxpayer. If the IRS were allowed to accept property as part of a taxpayer's settlement, and the taxpayer owned property within a CBRS unit, this authority could permit the United States additional flexibility in resolving such conflicts and in seeking to protect the CBRS.

16. Specifically address CBRS units with regard to donations.

Section 6 of the Tax Treatment Extension Act of 1980 provides the present authority for donations of conservation interests in land. It is difficult to determine, however, whether or not properties within CBRS units will be routinely considered to serve a conservation purpose. One possible resolution of this uncertainty could be a legislative amendment that states that the various units of the System specifically serve a conservation purpose. Such a provision regarding property in National Scenic Trails was recently included in amendments to the National Scenic Trails Act by Public Law 98-11.

A second uncertainty with the donation of conservation interests to protect a CBRS unit is the difficulty of determining the degree of protection required to qualify. Section 170(h)(5) of the Internal Revenue Code provides that the conservation purpose of a qualified contribution must be protected in perpetuity. There is no definition, however, as to what that means with regard to coastal barriers and there is no automatic applicability to CBRS units. One resolution of this situation would be to legislatively require that the DOI certify that the donation establishes a level of protection that is adequate to conserve the fish, wildlife, and other natural resources of the System. This could be modeled after the historic preservation rehabilitation program, also administered by the Department. Alternatively, this certification responsibility could be delegated to the qualified conservation organization actually accepting the donation.

17. Increase incentives to donate property on CBRS units.

The possibility of increasing incentives for donations that serve a conservation purpose has been widely considered. Incentives could apply to both partial and total donations. At the present time, donation of an owner's entire interest can typically be made to any qualified charity. No protection of the fish, wildlife, and other natural resources of a CBRS unit would necessarily be provided by such a donation. The program could provide distinctive treatment for the donation of an owner's entire interest in CBRS lands to a qualified conservation organization for a conservation purpose. Increased incentives for the donation of partial interests for a conservation

purpose could also be established. Tax credits have generally been considered with regard to estate taxes and are discussed below.

a. Provide carry-forward and percentage of adjusted gross income deduction provisions for donations of property in the CBRS.

The general limitation under present law is that a deduction for contributions of appreciated property in any one year may not exceed 30% of adjusted gross income. The value of a gift exceeding this limit in the year of transfer may be carried forward for no more than 5 years. Proposals under consideration in the Congress would raise the maximum amount of such a deduction to 50% of adjusted gross income and permit an unlimited carry-forward thereafter. The application of this approach to properties located within a CBRS unit would be an incentive for conservation through donations.

In this way, the Federal Government would allow owners that do not have a significant yearly income to participate in the program. A farmer operating a marginal farm on a valuable parcel of land has little incentive to donate a conservation easement under the existing restrictions. Modifying these provisions could increase the number of beneficiaries, thereby increasing the probability that valuable resources could be protected.

b. Provide credits against estate taxes.

The relationship between a donation by a living property owner and the taxes that will be borne by that owner's estate is critical. The donation opportunities provided the executor of the estate are equally important. Both of these factors have been considered in several of the proposed conservation tax bills.

With regard to prior gifts, these bills have proposed a credit against estate taxes otherwise due in a variety of different ways. One approach would be to permit the application of any unused portion of a gift deduction arising from a conservation donation as credit against estate taxes. This could apply to either a partial or an entire interest donation as long as it serves the requisite conservation purpose. The provision could include gifts to qualified conservation organizations for a conservation purpose, or merely gifts to the Federal Government.

A second option relates to donations made directly by the estate. This approach would allow the executor of an estate to make a conservation purpose donation and receive a credit against the applicable estate tax. The Deficit Reduction Act of 1984, Section 805, contained an authorization for donations to the U.S. Forest Service to serve as a payment in kind for estate taxes in the case of two specified private estates.

c. Permit donations of CBRS property to be valued at predisaster fair market value.

A corollary problem concerning all donations, but particularly important for donations of conservation interests, is valuation. Unrealistically low

valuations of donations for a conservation purpose serve to undercut significant private conservation efforts. Low appraisals occur for two reasons. First, the ideal time to encourage the gift of property on a CBRS unit will be after a major storm. At that point property may be at its lowest value because of storm damage. Second, gifts of conservation easements may not appear to convey any value because the donor often remains in possession of the area. At the time of donation the donor may not appear to be foregoing any value. Often the donation simply continues a situation that has existed for years. The result can be a low or nonexistent valuation. That valuation will then discourage other donations and leave an incentive for development.

With regard to storm damage, a possible approach would be to permit conservation donations to be valued at predisaster prices. This could be true for real property alone or it could also apply to previously existing improvements in some reasonable manner. Such an approach could also be applicable to both total and partial donations, or it could be limited to the donation of an owner's entire interest. In either case, however, it would apply only to donations that provide conservation in perpetuity.

The second concern--that conservation donations may not appear to convey any value--is also resolvable. Statutory recognition of the importance of conservation easement donations for the long term is one possibility. Under this approach, the value of the reservation of a life estate or term for years would be disregarded. Of course, no reservation inconsistent with the conservation purpose of the gift could be permitted.

A simple approach with regard to donations that convey only a partial interest would be to apply the "scope of the project" rule. This standard appraisal practice insulates property values from the direct effect of a governmental program when that property is acquired by the United States. As applied to a Federal program to encourage the protection of the CBRS units, such an approach could establish that this Federal program would not diminish the value of conservation donations.

The value of the donation of a conservation easement represents the difference between the highest and best use before and after the donation. Before the Government's recognition of the conservation value of these areas, their highest and best use would probably be for development. Accordingly, the value of the donation of a conservation easement would typically be great because the development rights being donated establish the highest value.

With the advent of a Federal conservation program, however, the highest and best use would probably change to a conservation or recreation purpose. Those persons interested in owning an interest in a conservation or recreation area would be encouraged to purchase, and the value of that interest would increase. The result of this change would be to diminish the difference in value before and after the donation and therefore make the value of a conservation donation insignificant. The Government's conservation program would have diminished the value of the conservation easement, not by changing the overall value of the property, but by changing the

nature of the highest and best use that would establish that value. Under the "scope of the project" concept this diminution in the value of the donation could be disregarded.

Enhancement in overall value resulting from a conservation program that may be adopted by the Government could also be removed from the appraisal process. Typically, however, project enhancement does not make a coastal barrier valuable. It is valuable because of its location. Governmental protection efforts may merely change the nature of the use that creates that value and thereby diminish the difference in value of the property before and after the donation of the conservation interest.

Dynamics of Tax Options

The timing of tax changes may be as important as the changes themselves. The following discussion addresses these administrative concerns.

Sunset provisions. A sunset provision on all incentives for conservation would have two significant effects. First, it would put an outside limit on the duration, and therefore the cost, of a tax incentive program. Second, it would encourage landowners to act quickly rather than delay a decision concerning the ultimate use of their property within a CBRS unit.

Effective dates. The effective date of these types of provisions would also appear to be very important as well. If the effective date is related to the passage of the CBRA in 1982, and not to the enactment of any tax changes themselves, then developers would not be encouraged to build immediately in order to avoid possible disincentives in the future. The possibility of a rush to development is also an important consideration with regard to the need for a balance between incentives and disincentives. A law containing both incentives and disincentives would create less immediate developmental pressure than an approach that just discourages noncompatible development.

Grandfather provisions. A corollary to the issue of effective dates is the question of providing certain continuing rights to owners in place at the time of the effective date. Continuation of traditional and compatible uses by original owners may be desirable. Accordingly, it may be appropriate to waive tax changes that would discourage these traditional and compatible uses. Such a grandfather provision would leave these owners in a status quo situation relative to the disincentives, but provide further incentives for conservation during the term that they are generally available.

The possibility of storm damage to or destruction of existing development should also be considered. While it may be initially appropriate to exclude some previously existing development, it would be consistent with the CBRA to discourage reconstruction in CBRS units.

It would also be possible to grandfather those eligible for any tax benefits in the nature of an antispeculation provision. The net effect would be to provide only original owners (i.e., those subject to the grandfather provision) with the incentives for conservation. This could discourage speculators from seeking to buy land within a CBRS unit in the expectation of

receiving a substantial tax windfall. In this case, the incentives for conservation would only apply to those traditional owners that have actually conserved the natural resources of their property in the past. The disincentives would, of course, be applicable to all future purchasers.

THE TAX CHANGES IN 1986 AND TAX POLICY OPTIONS

The Tax Reform Act of 1986 (TRA) made sweeping changes in the Internal Revenue Code. A guiding principle of the TRA was the reduction of the Code's interference with the economic decisions made by individuals and businesses. The TRA changes many of the provisions in the Code that interfered with market decisionmaking. Many of these changes are essentially those outlined in the previous section. For example, the TRA eliminates long-term capital gains deductions, limits casualty loss deductions, allows only straight-line depreciation of property over a longer time period, restricts interest deductions, eliminates investment tax credits, and imposes at-risk limitations on real estate holdings.

Because of the TRA, in the second portion of its study (after 1985) the Coastal Barriers Study Group focused its attention away from reducing tax incentives to develop coastal barriers and towards options that might promote donations of conservation easements. The Study Group considered a number of potential amendments to the Tax Treatment Extension Act of 1980.

1. Conclusively establish that the CBRS units serve a conservation purpose for conservation easement purposes.

2. Permit the donation of a fee-simple interest with the reservation of compatible term of years of life estate. This could serve to eliminate appraisal and valuation ambiguities with regard to the donation of easements.

3. Under the present law, the amount of tax deduction is typically limited to 30% of the owner's adjusted gross income. In addition, the deduction is only available at the time of the gift plus 5 years. It has been argued that this provision provides little incentive to donate valuable interests in land by less wealthy landowners. More owners might be encouraged to donate by:

   --permitting a longer carry forward, and
   --permitting the deduction of a higher percentage of adjusted gross or
   --creating a tax credit for the value of the conservation easement donation.

4. Remove the gift tax penalty for good faith conservation donations that are found not to qualify as conservation contributions.

5. Define the level of development (or establish a process through which it could be determined) that would be acceptable for CBRS purposes and that, accordingly, should be permitted to be retained by a landowner making a conservation easement donation.

6. Remove the authority for owners to donate their entire interest to any charity without regard to the preservation of a conservation purpose.

7. Remove the ability of landowners in CBRS units to deduct casualty loss from personal income tax on new structures unless a conservation easement is established on the property.

As these proposals were investigated, the DOI was assured by the Department of the Treasury that the interpretation of the rules under Section 170 of the Internal Revenue Code, the section governing conservation easements, has not adversely affected charitable contributions within the CBRS. In addition, present law allows a deduction for a contribution of a remainder interest in a personal residence or farm, and for the contribution of a remainder interest in other property if made to certain organizations exclusively for conservation purposes. The major thrust of the gift tax penalty proposed amendment was adopted in Section 1422 of the TRA.

The DOI believes that the IRS ruling procedure is sufficient for determining what level of development is possible without jeopardizing the "qualified" status of the conservation restriction for charitable deduction purposes. The DOI is concerned that restricting the charity to which a landowner can donate his property would be too great an infringement on the landowner's rights. Finally, disallowing casualty losses violates the general rule that the Internal Revenue Code should aim for proper management of income. A taxpayer denied casualty losses could be put in the difficult position of having zero economic income and positive taxable income. To require that the taxpayer donate a conservation easement on the property in order to retain the casualty loss would be excessively coercive, especially for taxpayers experiencing financial difficulty.

The public comments received on tax law amendments are summarized in Table 13. Several commenters have suggested that if the Tax Reform Act of 1982 precludes any tax amendments at this time, then tax options should be re-examined several years in the future after the Nation has adjusted to the provisions of the TRA and fully analyzed their implications. The State of Maine urged the development of tax amendments now; the State of Delaware had no specific tax suggestions but stated they continue to favor tax revisions that will increase the conservation of the CBRS.

RECOMMENDATIONS

The DOI recommends no tax amendments at this time. Several of the tax options considered for conservation of the CBRS have been incorporated in the Tax Reform Act of 1986. Furthermore, the DOI is confident that there are no special problems associated with the charitable contributions within the CBRS. Having just accomplished a major reform after 2 years of debate and legislative effort, a period of stability and certainty in tax law is necessary.

CHAPTER 10

THE IMPACT OF FEDERAL GENERAL REVENUE SHARING FUNDS ON UNDEVELOPED COASTAL BARRIERS

The CBRA exempts activities undertaken with general revenue sharing funds. These funds were used for various purposes by local governmental jurisdictions from 1972, when revenue sharing began, until 1986, when the Local Fiscal Assistance Act expired. One purpose of general revenue sharing was to increase the freedom of local jurisdictions in making spending decisions, while at the same time lessening the burden of Federal requirements that often came with other forms of financial aid. Therefore the State and Local Fiscal Assistance Act of 1972 did not restrict the use of funds to specific functional categories or purposes. Section 10(c)(4) of the CBRA, however, specifically requires an analysis of the effect, if any, of general revenue sharing grants on undeveloped coastal barriers.

Since 1972, the State and Local Fiscal Assistance Act has resulted in considerable unrestricted Federal payments to States (until 1980) and localities. About 40,000 governments, Indian tribes, and Alaskan native villages received funds at quarterly intervals. Money was divided according to interstate and intrastate formulas administered by the U.S. Treasury Department's Office of Revenue Sharing. Primary determining factors include population, per capita income, and the general tax base of recipient governments. Allocations of general revenue sharing funds therefore tended to be concentrated in those localities with large populations and high adjusted taxes. For example, in 1981-82, approximately 39% of the disbursements went to 217 local governments with populations over 250,000, while less than 2% of the total funds went to 18,747 local governments with populations below 1,000.

PURPOSE OF THE SURVEY

The purpose of this analysis is not to assess the equity or success of the general revenue sharing formulations, but to analyze the effect, if any, that general revenue grants have had on undeveloped coastal barriers, as stipulated in Section 10. It appears that the impact of these funds as expended on undeveloped coastal barriers within coastal communities has been relatively minimal.

An examination of aerial photographs of the 186 units in the Coastal Barrier Resources System revealed that only 20 areas in 6 States have sufficient development (existence of physical structures) for general revenue sharing

conceivably to have had an impact. These areas, identified by county and State, are listed below.

1. Shelter Islands (F06), Suffolk County, New York
2. Napeague (F10), Suffolk County, New York
3. Broadkill Beach (H00), Kent and Sussex Counties, Delaware
4. Bethany Beach (H01), Sussex County, Delaware
5. Topsail Beach (L06), Onslow County, North Carolina
6. Wrightsville Beach (L08), New Hanover County, North Carolina
7. Usinas Beach (P04A), St. Johns County, Florida
8. Matanzas River (P05A), St. Johns County, Florida
9. Ormond-by-the-Sea (P07), Volusia County, Florida
10. Coconut Point (P09A), Brevard County, Florida
11. Blue Hole (P10A), Indian River and St. Lucie Counties, Florida
12. Hutchinson Island (P11), St. Lucie County, Florida
13. North Beach (P14A), Broward County, Florida
14. Cape San Blas (P30), Gulf County, Florida
15. Four Mile Village (P31A), Walton County, Florida
16. Moreno Point (P32), Walton and Okaloosa Counties, Florida
17. Mobile Point (Q01), Baldwin County, Alabama
18. High Island (T02A), Chambers, Galveston, and Jefferson Counties, Texas
19. Bolivar Peninsula (T03A), Galveston County, Texas
20. Follets Island (T04), Brazoria County, Texas

All of the CBRS units in this list are undeveloped segments of coastal barriers adjacent to, or interspersed among, developed coastal barrier segments.

METHODS OF STUDY

To assess the impact of general revenue sharing funds in these areas, officials of county and community governments with jurisdiction on coastal barriers were contacted in 1984. Usually these officials were finance directors or public works directors, but on occasion the county or city manager was interviewed. At other times, the knowledgeable individual was a special assistant to one of the top officers. These spokespersons were asked whether their governments had used general revenue sharing funds for development activities on undeveloped coastal barriers at any time since the aid program began in 1972. Development was defined as the placement or alteration of any physical facilities which would affect the natural processes of the coastal barrier.

FINDINGS

The survey revealed that 2 jurisdictions out of the 20 surveyed--Volusia County (includes Ormond-by-the-Sea, CBRS unit P07) and the City of Fort Pierce (part of the city occupies the northern portion of Hutchinson Island, near CBRS unit P11), both on Florida's Atlantic coast--had used their Federal funds for development as defined above. Coastal barrier jurisdictions proved to be

similar to the rest of the Nation in using this assistance primarily for public health and safety (data from Census Bureau annual reports).

The governments differed in the nature of their commitments regarding general revenue sharing money. Some preferred to address immediate and temporary needs, while others spent their allocations for the same long-term programs year after year. An example of the former was St. Lucie County in Florida, which saved its general revenue sharing funds for a new jail, presumably an immediate problem. An example of the latter was Broward County, also in Florida, which has used its funds in a long-term mass transit program.

The two jurisdictions that made general revenue outlays for development did so for two very different purposes. For the Nation's bicentennial, Volusia County opened the Ormond-by-the-Sea Bicentennial Park and used $40,000 of general revenue sharing funds in fiscal year 1975-76 to construct a 1/4-mi shell road from the main highway into the 2-acre park. The county has spent no other revenue sharing money for coastal barrier development. The City of Fort Pierce, on the other hand, began a long range road paving program on Hutchinson Island in 1973, and has used nearly all of its general revenue sharing funds for this purpose since that time. When the program began, Fort Pierce, a city of 37,000 people, was receiving about $500,000 annually from general revenue sharing. In 1984, that figure was about $390,000. City general funds and State revenue sharing money also were used in the project, which also included storm drainage work and utility improvement.

The Hutchinson Island section of Fort Pierce consists of new condominium projects mixed with older, single family houses and commercial buildings. According to the City Manager, intersection improvements and traffic studies that could draw upon general revenue sharing funds probably will continue after the paving program is completed. The county was saving its general revenue sharing funds for a new jail, as noted above, and studying various means of financing bridge and road improvements which are needed to facilitate structural and population growth on the island. Adequate bridge access is deemed imperative to further growth on the 22-mi long island, which is hurricane-prone and the site of a nuclear power plant. Private developers are prepared to participate, and are applying legal and other forms of pressure.

ANALYSIS

In analyzing the impact of general revenue sharing funds at the two sites where local governments have drawn upon them for development projects, it was considered important to determine whether the projects would have been undertaken in the absence of revenue sharing. If so, the impact of the Federal program would then perhaps be less than meets the eye.

According to the Fort Pierce official, the city was "absolutely committed," by a resolution passed in late 1972, to the road paving program. This implies that Fort Pierce would have found other means of revenue to attain its goals, perhaps financing through borrowing, increasing taxes or charges, or eliminating or reducing one or more existing programs. Without general

revenue sharing funds, therefore, the paving program might have been undertaken anyway, although "maybe not as quickly." At the time, the roads in question were dirt arteries which moved traffic from residential areas of Hutchinson Island to the main highway.

By contrast, the Ormond-by-the-Sea Bicentennial Park and the road leading to it owe their existence to Federal money, according to an official of the Volusia County Department of Public Works. The bicentennial park was the idea of a group of county citizens to honor the Nation's 200th birthday celebration. The park has a children's playground, basketball court, and tennis court, but general revenue sharing funds were used only for the road leading from the coastal highway to a point slightly inside the park entrance. The park is about half a block from the beach.

In summary, limited research revealed only a 1/4-mi shell road leading to a small bicentennial park in Florida that owed its creation to the Federal general revenue sharing program. However, the infusion of general revenue sharing funds may have freed up other money to be used for development. Documentation of this possibility would be difficult, but at least one local finance officer indicated that this may have happened. Some jurisdictions, however, stressed that their policies were to protect coastal barriers and discourage development there.

CONCLUSIONS

Only two examples of the use of general revenue sharing funds for development purposes were found; therefore, the impact of the Federal aid program from 1972 until 1986 appears relatively minor. Of the two examples, apparently only one of the developments, a small bicentennial park with a short entrance road made of shells, would not have occurred without Federal financial support. Even if general revenue sharing funds helped divert other monies to development, it is unlikely that this impact was significant given the relatively small amounts of general revenue sharing funds going to most coastal barrier jurisdictions containing CBRS units and the philosophy of many of these governments to discourage development on coastal barriers. Because the general revenue sharing program expired in 1986, there have been no impacts since 1986.

CHAPTER 11

CONSERVATION OF COASTAL BARRIERS: THE NEXT STEP

Traditionally, the Federal role in coastal management has focused on acquisition, planning, and regulation. Enactment of the CBRA in 1982 marked a departure from this approach. In recognition of the insupportable public costs associated with development of the coastal barriers along the Atlantic Ocean and Gulf of Mexico coastlines, the Federal Government withdrew its financial support for investment in the remaining undeveloped barriers (the CBRS). These costs included not only recurrent expenditure of Federal revenues, but also the loss of human lives and the destruction of important fish and wildlife resources. An underlying thesis of the CBRA is that Federal financial assistance is so pervasive in real estate development on the coastal barriers that it interferes with and directly affects economic decisions. If Federal financial assistance were withdrawn, the economic feasibility of coastal barrier development under our market system could be tested.

Several noted coastal experts have predicted that the general trend of deterioration along the entire coastline will continue as long as the Federal Government continues to support development and post-storm reconstruction on those coastal barriers not included in the CBRS or protected by Federal, State, or local entities. Preliminary reconnaissance indicates that those units of the CBRS that were experiencing heavy development pressure before enactment of the CBRA have continued to develop regardless of the loss of Federal financial support.

The DOI has noted and does not disagree with the commenters who raise "equity" questions concerning the application of the CBRA to only undeveloped coastal barrier areas. There are many coastal areas outside the CBRS that are either developed or are not qualified for inclusion in the CBRS under DOI criteria which may continue to receive Federal funding for both new development and redevelopment after storms. Continued Federal assistance in these areas raises equity questions among those who were denied such assistance when their property was included in the CBRS. Other commenters argue that the expenditure of Federal funds in all high-hazard coastal barrier areas is "wasteful" or not cost effective.

In developed coastal areas that have experienced hurricane damage since 1982, for example, there is reconstruction, and in most cases, growth despite the continued threat of future storms. In the City of Galveston the annual rate of new construction grew from $30 million in 1982 prior to Hurricane Alicia to over $150 million in 1985 (Miller 1987). Yet, there is reason to expect that another hurricane will cause significant damage in the future.

Sea-level rise is another factor that will continue to be responsible for predictable barrier shoreline losses. From the end of the last ice age 15,000 years ago until about 5,000 years ago, sea level rose approximately 300 ft as the glaciers covering much of the Northern Hemisphere melted. Although it has been more stable since then, worldwide sea level has risen 4 to 6 inches in the last century. Because most of the Atlantic and gulf coast in the United States is also slowly subsiding, the apparent rise in sea level relative to most of the shoreline is even greater, about 1 ft in the last century (Hicks et al. 1983). That relatively slow trend is widely thought to be the underlying cause of most coastal erosion (Bird 1976; Pilkey et al. 1981).

Many scientists expect the rate of sea-level rise to continue to increase because of the increases in atmospheric concentrations of carbon dioxide and other "greenhouse gases." Because these gases allow sunlight to penetrate the atmosphere but retain outgoing infrared radiation (heat) in a manner somewhat analogous to the glass panels of a greenhouse, this phenomenon is commonly known as the "greenhouse effect." Without the greenhouse effect of the gases occurring naturally in the atmosphere, the earth would be 30 °C colder. The amount of carbon dioxide in the atmosphere is expected to double over the next century and the National Academy of Sciences (NAS) has estimated that this doubling could warm the earth an additional 3 °C in the next century. The combined impact of increases in the other greenhouse gases could warm the earth another 3 °C.

This warming of the earth would raise sea level by two major mechanisms: the ocean water volume would expand because of warmer ocean temperatures, and the melting of the alpine, Arctic, and Antarctic ice sheets would add huge volumes of water to the ocean. The EPA and NAS have estimated a 3- to 5-ft rise in sea level along the U.S. coast over the next century because of these processes (Hoffman et al. 1983; Revelle 1983). Emanuel (1987) has estimated that a doubling of atmospheric CO_2 could also result in a 40%-50% increase in the destructive potential of hurricanes.

The physical effects of sea-level rise include inundation of wetlands and other low-lying areas, beach erosion and barrier island overwash, and higher storm surges. Recent studies by the EPA estimate that 50%-85% of coastal wetlands could be lost if sea level rises as projected (Titus 1985; Kana et al. 1986). To a large degree, they note, the loss in wetlands will depend on whether development prevents new wetlands from forming further inland.

The impact of sea-level rise on coastal erosion has been well documented. Bruun (1962) showed that a 1-ft rise in sea level will erode the typical sandy beach 100-500 ft. For developed coastal barriers, the projected rise in sea level will dramatically increase the level of expenditures necessary for beach nourishment and stabilization projects.

The impact of sea-level rise on undeveloped barriers will vary. In some areas, sea-level rise may cause barrier islands to disintegrate gradually. This is already occurring in Louisiana. In other areas, barrier islands will narrow and washover will occur. Where there is a wide bay or where an undeveloped mainland shore can also retreat, the resulting landward migration of the barrier should pose little problem. Where a barrier is separated from

a developed mainland by a narrow bay, the bay will have to be artificially maintained if the citizens are unwilling to allow the barrier to cross the bay and become part of the mainland.

Sea-level rise may also have important implications for barriers that are undeveloped today, but are likely to be developed in the future. It is possible to plan new developments around the assumption of a retreating shoreline (Howard et al. 1985). Developers, however, may be reluctant to plan for a rise in sea level until it is actually observed, regardless of the scientific evidence. Titus (1985) suggests that new coastal communities employ "conditional planning" measures. These measures would put property owners on notice that a retreat will be necessary if sea level rises substantially, but would not impose any restrictions until a rise actually takes place. Titus argues that people who are unconcerned about the distant future sea-level rise would view such policies as costing them nothing, while those who are concerned about future sea-level rise would be satisfied that a long-term solution had been implemented.

During the 1970's, major environmental problems associated with the juxtaposition of developed and undeveloped areas became progressively more apparent and widespread. The rapidly urbanizing areas began to place demands on the entire natural ecosystem which caused impacts outside the developed areas themselves. Pollution of shellfish beds has become an increasing problem, especially on Long Island's south shore, but also locally in Massachusetts, New Jersey, Florida, Louisiana, and elsewhere. Offshore municipal dumping is threatening public recreational use of the beaches. Sewage and industrial pipeline effluents are contaminating nearshore habitats. Structural projects to maintain recreational beaches, prevent undermining of oceanfront buildings, and stabilize inlets are causing accelerated erosion and adverse ecological effects in the vicinity of the projects and in the areas immediately downdrift of the structures.

Where urbanized areas are located immediately updrift from protected areas, efforts to protect development and the growing economic base in the urban area conflict with the requirements for perpetuating the nearby natural area. The case of Ocean City, Maryland, which is located across a stabilized inlet from Assateague Island National Seashore, is a good example of this problem. The accelerated, landward shoreline recession of the north end of Assateague Island is attributable to the cumulative effects of human manipulation of the natural drift system by inlet stablization and by attempts to nourish the rapidly eroding beaches at Ocean City.

As developed areas continue to place greater demands on the resources of nearby undeveloped areas for ground water, assimilation of water pollutants, sand for beach nourishment, mosquito control (i.e., ditching), and space for public recreation, the severity of impacts at the interface of the two kinds of areas will increase along with the number of areas affected. Many of the coastal barriers of the Atlantic Ocean and Gulf of Mexico coasts contain both developed and undeveloped (often protected) areas on the same barrier. If we also consider the many areas where bay barriers abut developed mainland areas, the potential for problems at land-use interfaces is even greater.

In many areas under severe development pressure, particularly in Florida and North Carolina, conservation opportunities are rapidly disappearing. Today, large portions of the ocean shoreline are undeveloped and unprotected only in the States of South Carolina, Georgia, Florida, Louisiana, and Texas. Although it is difficult to predict future trends in a fluctuating economy, it seems safe to conclude that continued intense interest in both conserving and developing our remaining coastal barriers will mean that nearly all of these areas will be committed to one use or the other by the end of the century. Actions taken by the Government and the private sector during the next 12 years will affect the rate at which this process of commitment proceeds.

If planning for sea-level rise and grappling with the pressures of developed areas on fragile ecosystems are difficult problems, defining a policy towards reconstruction in coastal areas following major storms or hurricanes poses an equally arduous challenge. There is ample evidence that Federal subsidies support reconstruction, often increasing the Federal investment in coastal communities that experience repeated destruction by storms. Conservation of coastal resources could be enhanced and Federal involvement in the costs associated with coastal redevelopment could be reduced if the purposes of the CBRA were taken into account by Federal decisionmakers involved in coastal reconstruction following storms or hurricanes. The existing policy of simply replacing the structures that have been damaged or destroyed does not consider the special risks associated with development on coastal barriers. Additional efforts in public education could also help coastal barrier residents and Government officials make these difficult decisions in an informed manner.

A 1986 Federal Emergency Management Agency (FEMA) report to the President titled "A Unified National Program for Floodplain Management" sets forth a conceptual framework and identifies strategies fundamental to implementing a balanced approach to floodplain management. The report states that the customary sequence of events in the floodplain continues to be (1) flooding, (2) flood losses, (3) disaster relief, (4) flood control projects, and (5) more development in the floodplain until the next flooding starts the cycle over again. Average annual flood damages in the United States are now estimated to exceed $3 billion and are continuing to rise (FEMA 1986).

The FEMA report also points out a need for better Federal, State, and local coordination of floodplain management. A centralized floodplain data source and a better information program to inform the public and State and local decisionmakers about flood hazards and floodplain management is needed.

Coastal geologists, ecologists, engineers, lawyers, economists, and environmental managers have expressed concern about sea-level rise, the country's eroding shorelines, and coastal barrier development during the 1985 conferences ("Cities on the Beach--Management of Developed Coastal Barriers" in January 1985; and "Second Skidaway Institute of Oceanography Conference on America's Eroding Shoreline: National Strategy for Beach Preservation" in June 1985). Both conferences wrestled with the increasing problem of development or stabilization on one portion of a barrier negatively affecting the adjacent undeveloped beaches up or down the barrier. Both also advocated a policy of retreat from the shoreline and an end to all direct and indirect Federal expenditures in support of private coastal development.

In the 1987 Draft Report, the DOI proposed a joint study among the Federal agencies to develop alternative guidelines on which to base decisions about redevelopment following major storms. Several States commented that they should also be involved in such a study because State and local policies also have a major impact on post-storm activities. Several States also suggested the study should include the development of post-storm reclassification procedures which could allow barriers that become more than 50% "undeveloped" in a storm to be added to the CBRS. The States of Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, Alabama, and Mississippi favor a study. A summary of the public comments on a study and on additional public education about coastal barrier hazards appears in Table 14.

RECOMMENDATIONS

The DOI recommends that the Congress enact legislation directing that a joint study be undertaken by the DOI, the Department of Transportation, the Department of Commerce, the Department of Agriculture, the Army Corps of Engineers, the Environmental Protection Agency, and the Federal Emergency Management Agency, in consultation with the States, to develop additional options to address Federal subsidies on all coastal barrier areas, both developed and undeveloped, for consideration by Congress.

Consideration should be given to options such as guidelines on which Federal agencies could base decisions concerning redevelopment or reconstruction of coastal barriers following major storms (in response to conservation questions), a phase out of Federal expenditures throughout all coastal barrier areas (in response to equity questions), and other alternatives. For example, the Study Group could consider a Federal/State cost-sharing approach as follows: 75:25 during the first 5 years, 50:50 for the next 10 years, and 25:75 during the last 5 years which would result in a total prohibition of Federal subsidies on all coastal barrier areas after 20 years. As variations, this approach could be applied to new development outside the CBRS or redevelopment only. This joint study should be carried out in recognition of the many comments received concerning the equity of applying the prohibitions only within the CBRS and the continuing subsidization of development on coastal barriers outside the CBRS.

Table 14. Summary of public comments received on a joint study of post-storm reconstruction alternatives and public education about coastal barrier hazards. More than 6,150 individuals expressed opinions on the entire 1987 Draft Report by letter or petition.

State	Joint Study of Reconstruction Alternatives		More Public Education About Barrier Hazards	
	For	Against	For	Against
Dist. of Columbia	4	2	2	0
Florida	5	0	0	0
Maryland	2	0	1	0
Massachusetts	2	0	0	0
Mississippi	1	0	1	0
New York	1	0	0	0
North Carolina	4	0	0	0
Ohio	1	0	0	0
Pennsylvania	1	0	0	0
Rhode Island	3	0	0	0
Texas	2	2	1	0
Virginia	2	0	0	0
	28	4	5	0

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COMMENT LETTERS

The following comment letters express substantive opinions on the overall issue of whether to expand the CBRS and on the conservation and technical recommendations discussed in this volume. Some representative general letters of support or opposition are also included. Letters concerning individual States or Territories, including the official State or Territory letters, are reprinted in Volumes 2-22 of the Report. In many cases, letters contained substantive comments on both an individual CBRS unit in a particular State and on the conservation and technical recommendations discussed in this volume. The comments on the conservation or technical recommendations in these letters have been addressed in the text of this volume, but the letters are reprinted in the appropriate State or Territory volume.

All the comment letters received on the CBRA Section 10 study and a record of individual responses to these letters are available for public review in the Washington Office of the Fish and Wildlife Service.

20

U.S. Department of Transportation
Federal Highway Administration

400 Seventh St. S.W.
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APR 08 1987

In Reply Refer To:
HEV-20

Coastal Barriers Study Group
U.S. Department of the Interior
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Gentlemen:

This is in response to the Notice of availability published in the March 25 Federal Register entertaining comment on the Department of the Interior's proposed recommendations to Congress required by Section 10 of the Coastal Barrier Resources Act (CBRA). The Federal Highway Administration (FHWA) opposes recommendation 2(a) of section D, as presented on page 18 of the draft Executive Summary.

The draft report states, "The Department of Transportation has declared all Federal highways to be 'essential links' in the Federal Highway System and thus avoids additional consideration of whether its expenditures are consistent with CBRA's purposes."

This statement is inaccurate. The FHWA has, however, declared that all existing roads and highways on the Federal-aid system will usually be essential links. (A copy of the appropriate section from the FHWA guidance is enclosed.) The difference between these two statements is significant.

First, the draft report mentions "Federal highways." There are no Federal highways in any existing or proposed unit of the Coastal Barrier Resource System; a Federal highway being one that is owned and maintained by the Federal Government. The correct reference should be to highways on the "Federal-aid system." This system is an integrated network of interconnected highways proposed by the State(s) and approved by the Secretary of Transportation. By definition, highways on this system are usually essential to the network.

This leads to the second point. The FHWA's policy states that highways on the Federal-aid system are usually essential. There is no attempt to avoid the consideration of project consistency within the context of CBRA. We must keep in mind, however, that the intent of the CBRA is to remove federally supported incentives for new development but not to penalize existing communities.

Where a highway segment can be described and justified as "essential," such as being necessary to minimize the loss of human life, we feel that the exception 6(a)(3) should remain in the law.

Should you have any questions concerning the position of the FHWA, we are available at any time to discuss these issues further.

Ali F. Sevin, Director
Office of Environmental Policy

Enclosure

Taken from Page 2 of the "Guidelines for Implementing the Coastal Barrier Resources Act--Public Law 97-348," dated June 1984.

Exception Procedures Under Section 6 of CBRA

Section 6 of the CBRA, however, allows exceptions for certain actions after consultation with FWS. The repair, reconstruction, and replacement (but not expansion) of existing publicly owned roads that are essential links in a larger system or network may be excepted from the funding restrictions of the CBRA. This exception is stated at Section 6(a)(3) of the Act. Similar projects on roads not deemed essential links in a larger network may also be excepted, but only after the work is determined consistent with the purposes of the Act. Section 6(a)(6)(F) of the Act describes this exception process.

The FHWA has determined that all existing roads and highways on the Federal-aid system will usually meet the requirements of Section 6(a)(3), because they are, by the very nature in whch they are designated, important links in a larger network. The Federal-aid system of Interstate, primary, secondary, and urban highways is an integrated network connecting major urban centers and providing access to major traffic generators. You should be aware that the FWS may disagree with the "essentiality" of a particular link based upon its interpretation of the CBRA. Federally funded projects on roads not on the Federal-aid system will be coordinated with FWS under the Section 6(a)(6)(F) conditions. Examples of projects in this area would be those eligible for Federal funding from sources such as, the Safer Off-System Roads Program (23 U.S.C. 219) and the Disaster Relief Act of 1974 (P.L. 93-288).

Whenever a SHA proposes the use of Federal funds for the replacement, repair, or reconstruction of an existing highway within a unit of the CBRS, the FWS must be contacted to initiate the consultation process. The SHA should request consultation in writing directly from the appropriate Regional Director of the FWS within the framework of existing project coordination procedures required by the National Environmental Policy Act.

The request should indicate whether an exception under Section 6(a)(3) or Section 6(a)(6)(F) is appropriate. Federal-aid system projects will usually fall under Section 6(a)(3). Other projects would normally be treated under Section 6(a)(6)(F).

On all Federal-aid projects subject to CBRA, the SHA (for projects constructed under Certification Acceptance) and the FHWA Division Administrator (for all other Federal-aid projects) shall not approve any PS&E until the FWS has responded to a consultation request by providing comments on the question of consistency with the CBRA.

SHA - State highway agency
PS&E - Plans, specifications and estimate

1412

United States
Environmental Protection
Agency

External Affairs (A-100AE)
Washington DC 20460

EPA

Federal Activities

The Coastal Barriers Study Group
Department of the Interior
National Park Service
P.O. Box 37127
Washington, DC 20013-7127

Dear Sir or Madam:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the Environmental Protection Agency (EPA) has reviewed the Executive Summary of the "Draft Report to Congress: Coastal Barriers Resources System," dated March 1987. The draft report developed by the Coastal Barriers Study Group of the Department of the Interior represents a positive step toward reaching the goals of the Coastal Barriers Resources Act (CBRA) -- to protect human life and property, to discourage the waste of Federal expenditures, and to conserve natural resources.

The draft report contains a number of recommendations that are of concern to EPA, particularly those that could potentially affect wetland resources. EPA disagrees with the conclusion found on pp. 14-15 of the draft report that Federal regulatory programs currently assure regulatory consistency with the goals of the CBRA. EPA agrees, however, with the other recommendations in the report and, in some cases, suggests the strengthening of those recommendations.

Regulatory Consistency

The draft report states (pp. 14-15) that the major Federal programs that affect the Coastal Barriers Resources System (CBRS), such as permits for dredge and fill, "take fish and wildlife values into account" as presently applied and are therefore deemed to be consistent with the CBRA.

The finding that the major Federal permit programs affecting CBRA "take fish and wildlife values into account" is not synonymous, however, with a finding that such programs properly take CBRA into account, or that they are administered consistently with CBRA. Taking fish and wildlife values into account is a requirement of the National Environmental Policy Act, as well as other statutes (e.g., the Coastal Zone Management Act or Endangered Species Act). Accounting for fish and wildlife values does not, by itself, make Federal permit processes consistent with CBRA.

Based on the premise that existing regulatory programs take fish and wildlife values into account, the draft report then concludes that "(r)equiring regulatory consistency at the Federal level would depart from the basic CBRA premise that conservation can be achieved without increasing Federal regulatory involvement" (p. 15).

In support of that conclusion, the report states that "(N)one of these permits indicate a direct disregard for the purposes of CBRA." That language falls considerably short, however, of stating that none of the 250 Federal permits issued since passage of CBRA (October, 1982) for various types of construction activities on or adjacent to CBRA lands have been inconsistent with the goals or intent of CBRA. Further, requiring existing Federal permit programs to be administered consistently with CBRA does not, in our opinion, involve an increase in Federal regulatory involvement. A requirement for Federal regulatory consistency only requires that the Federal government's permit programs not work at cross-purposes to Federal law protecting coastal barriers.

EPA recommends the proposal be changed to require Federal consistency of permit programs with CBRA.

Geographic Scope

The draft report (pp. 7-8) recommends including the "undeveloped, unprotected coastal barriers of the Florida Keys, Puerto Rico and the Virgin Islands" in the geographic scope covered under the CBRS. As stated in the introduction to the report, the rapid growth in population and associated development has resulted in adverse impacts to the Atlantic and Gulf coasts, including threats to human life and public property from storms, wasteful expenditure of Federal monies, and damage to fish and wildlife habitats. These impacts are greatest where growth and development are greatest. The areas recommended in the draft report for inclusion in the CBRS -- the Florida Keys, Puerto Rico and the Virgin Islands -- are all areas experiencing development pressures and increasing impacts from human activities and should be included in the CBRS. In addition, we concur with the recommendation that the Great Lakes, Pacific Coast and other Pacific coastal barriers be studied and considered for protection under CBRA. The same conditions exist on these coastlines that prompted Congress to pass this protective legislation for the Atlantic and Gulf coasts. Although the states of California, Oregon and Washington have strong Coastal Zone Management Programs, to include selected areas of their coastlines under CBRS would serve to strengthen those programs, without imposing an additional regulatory burden on the public.

Associated Aquatic Habitat

The draft report (pp. 8-9) recommends that all the aquatic habitats associated with existing CBRS units be added to the CBRS. This would include "adjacent wetlands, marshes, estuaries, inlets and nearshore waters." This recommendation recognizes that these aquatic sites contribute

to both the ecological and economic welfare of coastal barriers. We believe that the results of existing ecological research, and the experience of EPA in protecting coastal wetland resources under Section 404 of the Clean Water Act, provide strong evidence supporting this recommendation, and we support these proposed additions to CBRS. Furthermore, we urge that the existing definition used under the Clean Water Act to define wetlands be utilized in the implementation of this recommendation. To do so would help assure that the considerable amount of available mapping and other documentation already developed by EPA, the Fish and Wildlife Service, the Corps of Engineers and other Federal agencies would be utilized in defining areas to be included under the CBRS. It would also encourage use of uniform wetland definitions among Federal agencies.

We agree with the discussions provided in the report (pp. 4, 8 and 21) that describe how barrier islands function for the protection of the landward wetlands from salt water intrusion. DOI may also want to consider expanding the current discussion in the draft report to cover an equally serious problem, i.e., encroachment of silt and freshwater from the landward side of the barrier islands. This is a significant problem in states where gas and oil exploration and production are a major activity. Canals cut through the wetlands to accommodate the movement of barged equipment to drilling sites provide avenues for intrusion of silt and freshwater, both of which are destructive to fragile barrier island and wetland ecosystems.

Secondary Barriers

The draft report recommends (p. 9) that secondary barriers be added to the CBRS. Secondary barriers are barriers located in large and well defined embayments, and these barriers may include wetlands and other critical ecological resources. Initiatives undertaken by EPA and other Federal agencies to more effectively protect these bays, such as the Chesapeake Bay, are consistent with their inclusion in the CBRS, and we concur with this recommendation.

EPA appreciates the opportunity to comment on this draft report. We recommend that the proposals developed by the Department of the Interior, modified or supplemented by the additions proposed in this letter, be adopted. If you have any questions regarding these comments, please contact Dr. Yvonne Weber of my staff at 475-8789.

Sincerely,

Richard E. Sanderson
Director
Office of Federal Activities

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301-8000

ACQUISITION AND LOGISTICS
E/EE

MAR 4 1987

Mr. P. Daniel Smith
Deputy Assistant Secretary for
Fish and Wildlife and Parks
Department of the Interior
Washington, DC 20240

Dear Mr. Smith:

Thank you for your letter of February 15 requesting our views on your proposed recommendation that military lands be deleted from the Coastal Barrier Resources System.

We enthusiastically concur with the recommendation. We agree that procedures mandated by the Coastal Barrier Resources Act are redundant with those of the National Environmental Policy Act and the Sikes Act. Our close coordination with the Fish and Wildlife Service on Defense proposals that may impact wildlife resources and land use, in accordance with those two laws, satisfies the purposes of the Coastal Barrier Resources Act.

Your continuing support and cooperation in our natural resources program is appreciated.

Sincerely,

Thomas P Christie
for the
Assistant Secretary of Defense
(Acquisition and Logistics)

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103

13 JUL 1987

Honorable William P. Horn
Assistant Secretary for Fish
and Wildlife and Parks
Department of the Interior
Washington, D. C. 20240

Dear Mr. Horn:

This responds to your request for the views of the Department of the Army on your draft report of recommendations to the Congress as required by Section 10 of the Coastal Barrier Resources Act (CBRA). My comments on your draft report and on the proposed changes to the Coastal Barrier Resources System (CBRS) are discussed below in the same order as in your report.

Geographic Scope: This proposal goes well beyond the bounds of the existing program. As such, it seems to run counter to other Federal efforts to control expansion of the Federal Government.

Associated Aquatic Habitats: The Department of the Army does not agree that "associated aquatic habitats" is synonymous with "the entire area subject to diminished wind, wave, and tidal energy." Barrier islands are indeed the first line of defense to the mainland from storm attack, but the embayments between the barrier and the mainland are just that - embayments, and not "associated" habitat, even though they are important habitat to many species. The Federal Government should not expand the CBRS as proposed.

Secondary Barriers: Similarly, we do not agree with your recommendation to include barriers within major embayments and estuaries.

"Otherwise Protected" Coastal Barriers: We do not agree with your recommendation to expand CBRS to include inholdings within conservation areas protected by Federal, State or local laws. The laws themselves should provide sufficient protection.

Federal Stewardship: The Department of the Army agrees with your proposed recommendation. Military lands should be automatically exempt from CBRA restrictions.

Regulatory Consistency: We agree with your proposed recommendation. In those States with approved Coastal Zone Management (CZM) plans, the Corps of Engineers permitting process adequately accommodates the CBRA purposes.

Tax Policy Alternatives: We offer no comment.

Other Amendments to CBRA:

Paragraph 1: The proposal to prohibit Federal funding for activities outside CBRS units will be extremely difficult if not impossible to manage. It will engender endless debate over the connection between such activities and the CBRS. We recommend against such a proposal.

Paragraph 2(a): Essential Link: The Department of the Army considers that Federal channels and harbors are an essential link in the navigation system of this Nation, and that Section 6(a)3 must be revised to acknowledge that these federally authorized waterways are an essential link in the overall transportation network, and in the economic well-being of coastal mainlands and adjacent barrier islands. The planning, design, construction, operation, and maintenance of such essential links are already accomplished in a manner which achieves the purposes of the CBRA, and brings a balance to the use of coastal resources. These projects are consistent to the maximum extent practicable with CBRA, and they are carefully weighed to achieve overall public benefit. Section 6(a)3 should be strengthened, not deleted.

Paragraph 2(b): Dredged Material Disposal: We do not agree that Section 6(A)2 needs to be amended. The Corps of Engineers now creates many marsh and wildlife areas with dredged materials. Its regulations are sufficient to ensure that environment is protected. Also, the premise that conservation can be achieved without increasing Federal "regulatory" involvement is inconsistent with your recommendation.

Paragraph 2(c): Recreational Projects: We have no comment to offer.

Paragraph 2(d): Technical Assistance: We concur that no change should be made to the treatment of technical assistance.

Paragraph 2(e): Federal Agency Compliance: We agree with your recommendation to propose no amendment to address block grants.

Paragraph 3: We agree with your recommendation to delete Section 7, which currently requires annual OMB certification of agency compliance with CBRA.

Your discussions under the headings of "Description of Coastal Barriers" and "Conservation of Atlantic and Gulf Coast Barriers: The Next Step," concentrate largely on barrier island dynamics, forces on the barriers, structural dynamics, sea level rise, inlet dynamics, and coastal processes. The general manner in which these sections are written may lead the reader to erroneous conclusions regarding the physical processes on coastal barriers. Additionally, we do not concur in your recommendation that a joint study be undertaken to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers following major storms. Although the issue is certainly important, a more appropriate mechanism of land use planning is through the several States' CZM planning and permitting processes. If the issue of land use planning is to be addressed, it should be in a forum that clearly spells out the intent, rather than as a subset under CBRA.

Some general comments:

We do not believe that Congress intended for Federal navigation projects that are in compliance with environmental laws be regulated by CBRA. Construction, maintenance, and improvements to all federally authorized navigation projects should be excluded from the CBRS.

There are many areas within your proposed expansion of CBRS that would have sections of the Gulf and Atlantic Intercoastal Waterways passing through them. Although maintenance of existing navigation

projects is exempt, the problem of dredged material disposal for those areas is critical. Section 6(a)(2) presently exempts maintenance, including dredged disposal, from the prohibitions of CBRA, and we strongly believe that this section of CBRA not be amended. Dredged material disposal sites are an integral part of all Federal navigation projects, and must remain exempt from CBRA.

Thank you for the opportunity to comment on your draft report to Congress on the Coastal Barrier Resources Act. I look forward to working with you as the final document evolves to ensure that programs important to the Secretary of the Army are addressed appropriately.

Sincerely,

John S. Doyle, Jr.
Acting Assistant Secretary of the Army
(Civil Works)

G. Edward Dickey
Deputy for Program Planning,
Review and Evaluation

611

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
Washington, D.C. 20013-7127

Dear Sir:

Thank you for your letter and the draft report entitled "Report to Congress: Coastal Barrier Resources System" received by the National Oceanic and Atmospheric Administration April 15, 1987. I have been requested to provide this Office's views.

We noted with agreement the recommended addition of "Associated Aquatic Habitats, Secondary Barriers, and 'Otherwise Protected' Coastal Barriers" to the Coastal Barrier Resources System (CBRS). Your report correctly recognizes the importance of coastal, estuarine, wetland, and nearshore habitats to fish. We encourage you to recommend as broad a CBRS as possible to protect against unwise development that often is detrimental to marine fisheries habitat.

Sincerely,

Dr. Nancy Foster
Director
Office of Protected Resources
and Habitat Programs

1163

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Washington, D.C. 20235

N/ORM4:MJ

Mr. Jack Brown
Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Mr. Brown:

The Office of Ocean and Coastal Resource Management (OCRM) has reviewed the Executive Summary of the Report to Congress: Coastal Barrier Resources System and has the following brief comments on the report. Management of coastal development to minimize loss of life and property is a basic objective of the Coastal Zone Management Act. Under this Act, OCRM supports the efforts of the state coastal management programs to deal with this issue. We would, therefore, like to be actively involved in the study which you propose to undertake to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers following major storms or hurricanes.

Sincerely,

Peter L. Tweedt
Director

752

NASA
National Aeronautics and
Space Administration

Washington, D.C
20546

Reply to Attn of: NXG

Coastal Barriers Study Group
National Park Service
Department of the Interior
P. O. Box 37127
Washington, DC 20013-7127

Subject: Coastal Barrier Resources System

As requested, we have reviewed the report and recommendations you will be submitting to Congress as required by the Coastal Barrier Resources Act (CBRA). We are pleased that the two National Aeronautics and Space Administration (NASA) launch sites located on barrier islands (the Kennedy Space Center in Florida and the Wallops Flight Facility in Virginia) are not recommended as additions to the Coastal Barrier Resources System (CBRS). As you know, we feel quite strongly that sufficient legislation already protects these Federal holdings, and that NASA's stewardship and commitment to the environment further enhance and strengthen the objectives of the CBRA. In this same vein we agree with your recommendation that every effort should be made to incorporate future surplus Federal barrier properties into the CBRS.

We appreciate your objective and constructive approach to this matter.

Billie J. McGarvey
Director
Facilities Engineering Division

766

US Department of Transportation
United States Coast Guard

Commandant
United States Coast Guard

Washington, D.C. [illegible]
Staff Symbol: G-MPS-1
Phone: (202) 267-0495

16600

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, DC 20013-7127

Gentlemen:

This is in response to Assistant Secretary Horn's letter of March 31, 1987 to Admiral Yost, requesting the Coast Guard to identify its lands that are within the Coastal Barriers Resource System (CBRS). U.S. Coast Guard Station Ponce de Leon is identified in Volume 14 of the Florida charts, page 24, New Smyrna Beach, Section P08 as being within the CBRS. It is requested that the Secretary of the Interior recommend deletion of this property from the CBRS in his final report.

Sincerely,

[signature]
[illegible]
Captain, U.S. Coast Guard
Acting Chief, Office of Marine Safety,
Security and Environmental Protection

Encl: (1) Chart of New Smyrna beach
(2) Assistant Secretary Horn's ltr of March 31, 1967

185

375

General Services Administration
Public Buildings Service
Washington, DC 20405

Dear Sir:

This is in response to a recent letter received by the General Services Administration from Mr. P. Daniel Smith, Assistant Secretary for Fish and Wildlife and Parks, concerning the publication, "Report to Congress: Coastal Barrier Resources System."

At Mr. Smith's request, we have reviewed the document and the Coastal Barriers Study Group's recommendations regarding the undeveloped barriers inventory and management alternatives. Although we appreciate the opportunity to review this publication, we have no comments to make on the subject.

Sincerely,

[signature]
THOMAS M. SHERMAN
Acting Commissioner

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, DC 20013-7127

1680

TOMMY G. THOMPSON

Governor
State of Wisconsin

December 2, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Coastal Barriers Study Group:

The State of Wisconsin supports the goals of the Coastal Barrier Resources Act, and I urge the Department of Interior to expand the Coastal Barrier Resources System to include the Great Lakes shoreline.

Great Lakes coastal barriers share many characteristics with those on the Atlantic and Gulf coasts, especially in terms of function. They absorb much of the energy of coastal storms, erosion, and flooding, protecting the mainland in the process. They are very important components of Great Lakes coastal ecosystems that nourish a rich diversity of fish and wildlife. The costs of the impacts of natural forces on coastal development has become painfully clear during these years of high Great Lakes water levels, and I believe that removing federal incentives to develop fragile coastal barriers can be one effective way to keep down those costs in the future. There is no reason why a coastal barriers program that has been successful on the Atlantic and Gulf coasts should not be applied to the Great Lakes, our nation's fourth coast, as well.

Wisconsin stands ready to continue discussions with the Department of Interior that were begun in 1985 concerning the designation of specific sites in the state. I hope that you will recommend to Congress expansion of the Coastal Barrier Resources System to include the Great Lakes.

Sincerely,

TOMMY G. THOMPSON
Governor

TGT/bmh

Room 115 East, State Capitol, P.O. Box 7863, Madison, Wisconsin 53707 • (608) 266-1212

293

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Brule Area Headquarters
Box 125,
Brule, WI 54820
715/372-4866

Carroll D. Besadny
Secretary

April 30, 1987

Coastal Barrier Study Group
U.S. Dept of Interior - NPS-498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Sirs:

I am writing to you regarding your recent final draft report on the Coastal Barrier Resources Act.

I am pleased and support your recommendation to include within the Coastal Barrier Resources System coastal barriers of the U.S. Virgin Islands, Puerto Rico, the Florida Keys, New Jersey, and Maryland, and the large embayments along Chesapeake Bay and Long Island Sound.

I am disappointed that you have not included Great Lakes and Pacific coastal barriers within the system. I am very familiar with Wisconsin's shoreline on Lake Superior and many of the shoreline problems due to high water and inappropriate development of the shoreline, much of which has involved some degree of federal funding. Great Lakes and Pacific coasts should be protected by the Coastal Barrier Resources Act. These coastal barriers serve the same protective functions for the mainland, are equally vulnerable to storm and erosion damage, and have experienced the same development pressures (especially in recent years) as the Atlantic and Gulf coasts.

I am also disappointed that you have not included Coast Guard and military lands for the Coastal Barrier Resources System. These lands also deserve the same protection.

Will you please reconsider your position regarding the Great Lakes and Pacific coasts, and Coast Guard and military lands. Please include these areas in the Coastal Barrier Resources System and give them the protection that they need and deserve. Thank you.

Sincerely,

Fred Strand

Fred Strand
Wildlife Manager

FS:b

1182

RICHARD F. CELESTE
GOVERNOR

STATE OF OHIO
OFFICE OF THE GOVERNOR
COLUMBUS 43266-0601

June 23, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P. O. Box 37127
Washington, D. C. 20013-7127

Dear Coastal Barrier Study Group:

I am writing to urge the Department of Interior to recommend expansion of the Coastal Barrier Resources System (CBRS) to include the Great Lakes Shoreline.

I support the intent of the Coastal Barriers Resources (CBR) Act to protect the public health, safety and general welfare of our valuable national resources and strongly believe that the private, underdeveloped areas along the Great Lakes coast warrant the same protection as the coastal barriers of the Atlantic and Gulf Coast.

The Great Lakes coastal barriers share many similarities with those on the Atlantic and Eastern coasts including a composition of unconsolidated sedimentary materials. The coastal barriers of the Great Lakes also provide comparable protection from storms, erosion, and flooding, and, in turn, are very vulnerable to damage from these forces. In addition, like their eastern and southern counterparts, the fragile wetlands associated with the Great Lakes coastal barriers are home to a diversity of fish and wildlife, including many recreational important fish species.

Perhaps most importantly, in light of the damage that record-breaking water levels are causing along the Great Lakes shoreline, inclusion into the System would be an ecologically-sensitive and economically-sound means to prevent future high water problems.

I urge the Interior Department to reconsider its decision and recommend expansion of the System to include the Great Lakes coast. With further consultation of the states, I also request a revision of the 1985 maps of potential CBRS units along the Great Lakes shoreline.

Sincerely,

Richard F. Celeste

Richard F. Celeste

RFC/jm

187

637

ODNR
OHIO DEPARTMENT OF NATURAL RESOURCES

Fountain Square
Columbus, Ohio 43224

22 May 1987

Coastal Barriers Study Group
U.S.Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

RE: Report on 1982 Coastal Barrier Resources Act.

Dear Sir/Madam:

Our coastal resources, including barrier beaches and associated aquatic habitats, are among our nation's most important, yet lmost threatened natural resources. We urge you to support the expansion of the Act to include protection for the Great Lakes, including state and federally owned areas.

Development of these fragile coastal areas is hazardous and costly to all of us, whether we are natural resource managers or taxpayers, because we must ultimately subsidize unsound coastal management practices in some way or another.

The Great Lakes coasts are plagued by the same problems as the sea coasts, and perform the same beneficial functions for man and wildlife resources. Therefore, we will appreciate your support of proposals that will not only strengthen the Act, but also include the Great Lakes into the System.

Best regards,

Gene Wright, Area Manager

Linda Feix, Education Coordinator

Old Woman Creek State Nature Preserve
and National Estuarine Research Reserve
2514 Cleveland Road, East
Huron, Ohio 44839

Richard F. Celeste, Governor

669 ODNR

OHIO DEPARTMENT OF
NATURAL RESOURCES

Fountain Square
Columbus, Ohio 43224

May 28, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

RE: Report to Congress on Coastal Barrier Resources System, Executive Summary and the Federal Register Notice, March 25, 1987

Dear Sir:

The above referenced report and the proposed recommendations to Congress have been reviewed. Although the Ohio Lake Erie coastal area and the Great Lakes are presently not included in the Coastal Barrier Resource System (CBRS), ODNR does support the intent of the Coastal Barrier Resources Act (CBRA). The ODNR encourages the protection of the public health, safety and general welfare, and the protection of our valuable natural resources, principles which are embodied in the Act. We would like to provide comments on the report.

Even though the Great Lakes are not included in the CBRS, there are areas on the Lake that would benefit from provisions of the CBRA. We concur with the report's recommendation that additional study and consideration of the Great Lakes should be conducted before the undeveloped coastal barriers of the Great Lakes are recommended for inclusion in the CBRS.

The Ohio Lake Erie shoreline is highly developed. Most "undeveloped" areas are committed to several state parks, nature preserves and wildlife refuges. We agree with the Department of the Interior that federally subsidized development is necessary to allow access and to accommodate visitors to these public conservation and recreation areas. ODNR supports the continued exclusion in the CBRS of recreational and conservation lands that are protected by federal, state and local governments. We also support the recommendation that any CBRS lands which are added to a conservation or recreation unit managed by a government agency would automatically become exempt from CBRA's restrictions. ODNR

agrees with the proposed recommendation that privately owned, undeveloped coastal barriers held for conservation or recreational purposes be automatically included in the CBRS if these lands were to come up for sale, and this sale would be for purposes of development that are inconsistent with the CBRA.

We appreciate the opportunity to comment on your recommendations.

Sincerely,

JOSEPH J. SOMMER
Director

JJS:pae

cc: Ed Hopkins, Office of Governor, Columbus
Becky Blood, Office of Governor, Washington, D.C.

1670

STATE OF MICHIGAN
OFFICE OF THE GOVERNOR
LANSING

JAMES J. BLANCHARD
GOVERNOR

November 5, 1987

Coastal Barrier Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Coastal Barrier Study Group:

The Great Lakes coastal barriers share many similarities with those on the Atlantic and Eastern coasts including a composition of unconsolidated sedimentary materials. The coastal barriers of the Great Lakes also provide comparable protection from storms, erosion, and flooding, and, in turn, are very vulnerable to damage from these forces. In addition, like their eastern and southern counterparts, the fragile wetlands associated with the Great Lakes coastal barriers are home to a diversity of fish and wildlife, including many recreationally important fish species.

The Coastal Barrier Resources Act is a mechanism which may offer an ecologically-sensitive and economically-sound means to aid in protecting the Great Lakes ecosystem. To assess the usefulness of the Act for the Great Lakes states, it is necessary to have an updated inventory of the currently undeveloped, unprotected coastal barriers.

I request that the Department revise the 1985 maps of potential undeveloped, unprotected Coastal Barrier Resources System units along the Great Lakes shoreline based on the previous comments received from us, the public, and the results of aerial photography as soon as possible.

Thank you for your assistance.

Sincerely,

James J. Blanchard

JAMES J. BLANCHARD
Governor

189

679

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

BOX . 500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55155-40_____

DNR INFORMATION
(612) 296-6157

June 2, 1987

Mr. Jack Brown
Coastal Barriers Study Group
National Park Service
U.S. Department of Interior
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Mr. Brown:

This letter is to express our support for the inclusion of the Great Lakes in the Coastal Barrier Resources System. In September, 1985 the Minnesota Department of Natural Resources requested that Park Point in the City of Duluth on Lake Superior be considered for inclusion in the Coastal Barrier Resources System.

Upon closer scrutiny of the coastal barrier program, it appears as though the program will have negligible impacts on Park Point because part of it is already developed and much of the rest is in public ownership. In spite of these facts we feel that the Coastal Barrier Program is important to protect unique barrier resources and to prevent unwise development. The high water levels on the Great Lakes in recent years have demonstrated how development of coastal barriers such as Park Point and even other shoreland areas can be unwise when faced with rare climatological events such as we have been experiencing.

We support the inclusion of the Great Lakes in the Coastal Barrier Resources Program to help protect these environmentally sensitive barrier areas from further unwise development. If you have additional questions about this position please contact Mr. Joseph Gibson, Federal Projects Coordinator at (612) 296-2773.

Sincerely,

Steven G. Thorne
Deputy Commissioner

cc: Ron Nargang, Director
Division of Waters

AN EQUAL OPPORTUNITY EMPLOYER

824

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

BOX , 500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55155-40_____

DNR INFORMATION
(612) 296-6157

June 9, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P. O. Box 37127
Washington, D.C. 20013-7127

To Whom it Concerns:

I am writing in reference to the Coastal Barrier Resources Act (CBRA). I am very concerned that the Great Lakes and the Pacific Coast have been dropped from the system.

I urge that inclusion of these coastal systems be reconsidered. As coordinator of the State Natural Heritage Program, I can attest to the ecological significance of the areas that were previously considered for inclusion. In particular, Minnesota Point contains a fragile dune complex that provides habitat for state endangered plants and animals.

The Natural Heritage Program maintains a computerized database on the occurrence of endangered species and threatened community types. If we can provide additional data for your review and evaluation, please feel free to contact us.

Sincerely,

BARBARA COFFIN
Coordinator
Natural Heritage Program

BC:rcm

AN EQUAL OPPORTUNITY EMPLOYER

190

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New York State Department of Environmental Conservation

Box 292, Cape Vincent, NY 13618

Henry G. Williams
Commissioner

June 19, 1987

Coastal Barriers Study Group
U.S. DOT
National Park Service - 498
PO Box 37127
Washington, DC 20013-7127

To Whom It May Concern:

I am writing on behalf of the Great Lakes Fishery Commission's Habitat Advisory Board to urge the inclusion of the coastal barrier areas of the Great Lakes in the expansion of the Coastal Barrier Resources Act of 1982.

For reasons unknown to this Board the US Department of Interior has not included the Great Lakes coastal barriers in proposed expansion of the U.S. Coastal Barrier Program.

Further loss of the existing coastal barriers will cause serious degradation or loss of critical Great Lakes fish and wildlife habitats, that are generally irreplaceable.

Sincerely,

William A. Pearce
Chairman - Great Lakes
Habitat Advisory Board

cc Board Members
C. Fetterolf
Chris Branson

OREGON
NATURAL
RESOURCES
COUNCIL

MAIN OFFICE
1161 LINCOLN STREET
EUGENE, OREGON 97401
503 344 0675

June 8, 1987

Mr. Don Hodel, Secretary
Department of Interior
National Park Service-498
PO Box 37127
Washington, DC 20013

Dear Don,

We are writing to express our utmost dissatisfaction that an inventory for Oregon (and the Pacific Coast) was not included with your recently released Report to Congress containing recommendations for expansion of the Coastal Barrier Resources System (CBRS).

In August, 1985, the Oregon Natural Resources Council (ONRC) provided maps and detailed comments to the Department of Interior's (DOI's) Draft Coastal Barrier Inventory. We believe that the Coastal Barriers Study Group's draft inventory, along with citizens' comments, had the potential for providing a comprehensive inventory of Oregon's coastal wetland barriers. In addition to the coastal barriers identified by the DOI in 1985, ONRC identified 7 more locations that met the qualifications for coastal barrier status. After much detailed research, ONRC also recommended several boundary expansions and deletions of certain Coastal Barriers consistent with the Act. (Please refer to the enclosed letter.)

When DOI issued the draft national inventory of undeveloped coastal barriers in the spring of 1985, it included barriers on all United States coastlines. As vast amounts of data were collected and public comments were taken, we were extremely disappointed to see that no recommendations were made (nor even final inventories released) to include areas along the Pacific, Great Lakes, Alaska, Hawaii, or American Samoa Coastlines. Although these locations vary geologically from barriers along the Atlantic Coast, they are no less vulnerable to disasterous changes. ONRC believes that the original inventory should be released along with the current report to Congress, so that further consideration of coastal barrier designation on these other coastlines may continue.

Ending federal subsidized development in these storm hazard locations is necessary to protect Oregon's fish and wildlife habitat, as well as economically important scenic values. Generally speaking, development of coastal wetland barriers should never be encouraged, as these sand and bay bar coastal locations are the most environmentally sensitive, as well as least suitable, for any sort of permanent development.

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Since our comments dated August 26, 1985, additional sand accretion and errosion along sandspits and baybars, further altering Oregon's coastline and creating economic hardships, have occured along some of Oregon's already overdeveloped barriers. Examples:

In January, 1986, the sandspit at Seaside, Oregon lost about 300 feet of oceanfront land, as the Necanicum River changed its course. On the weekend of January 12, 1986, crews worked late into the night, dumping rock to build riprap wall in front of beach homes threatened by erosion. High tides ate away more than 40 feet of sand dunes over that weekend. Homeowners asked the U.S. Army Corps of Engineers and the Oregon Division of State Lands for assistance, but since the land is not in public ownership, these agencies could not help. Homeowners also asked the Corps (at other taxpayers expense) to consider rechanneling the river or changing its direction.

In October, 1985, the Governor of Oregon designated the city of Waldport, the Alsea Bay Bridge, and portions of U.S. 101 through Lincoln County a disaster area. The Alsea Bay Spit was developed in the 1970's, and houses extended only part way down the spit, leaving the last lot about 1500 feet from the river's mouth. But in late 1985, the waves and bay currents abruptly sliced away the end of the spit, moving away millions of tons of sand and leaving homes on a precarious brink. Now, with the shortened spit, the town of Waldport is not protected from the direct energy of the ocean. Oregon State University researchers have reported an 80 percent chance of serious flooding in Waldport over the next 2 years. Other bays and sandspits on the central Oregon coast, less intensively developed, have undergone similar geologic and hydrologic transitions, but with little or no press attention only because there was no threatened loss of life or property.

According to scientists, major erosion and flooding from rising ocean levels will reshape the Oregon Coast in the next century. The Pacific Ocean and other oceans are rising, reportedly because of the "greenhouse effect". The scientific community generally agrees the sea-level rise will accelerate dramatically in the next 100 years. According to Jim Good, a scientist with Oregon State University's Sea Grant program, conservative estimates indicate an anticipated rise of 2 to 4 inches along the Oregon Coast by the end of this century. He expects this will be up to at least 1 foot by 2025, and 1.5 to 2.5 feet by 2050. Low-lying agricultural lands along many coastal estuaries will become salt marshes and tideflats.

Although the Pacific Coast does not experience hurricanes like the East Coast, it is vulnerable to other types of threats. Perhaps the most impressive demonstration of the ocean's power is the earthquake triggered tidal wave, or "tsunami." Most tsunamis occur in the Pacific Ocean because of a zone of extreme seismic activity around the rim of the ocean. Two have struck the coast in recent years. One, in 1964, damaged bridges and dwellings along the shores of the Necanicum and Neawanna Rivers. Other hard-hit areas were Cannon Beach, the Waldport-Alsea area, Florence and Coos Bay. Also during the 1964 tsunami, four children drowned as their family slept on the beach at Beverly Beach State Park. The occurrence of tsunami along the Oregon Coast is very sporadic and unpredictable. However, there is a strong probability that another will

occur within the next 10 to 20 years (Physical Processes and Geologic Hazards On The Oregon Coast, OCZM Assoc., Inc., 1979.)

High waves are a frequent happenstance along the Oregon Coast, and cause near-predictble damage on a regular basis. During winter months, the larger breaking waves reach an average of about 15 feet. Individual storms produce maximum daily waves with significant heights of some 23 feet. (Waves of this height were measured in December 1972, October 1977 and February 1978.) Three episodes of waves of similar magnitude battered the Oregon coast during the winter of 1982-3. These waves, associated with El Nino, particularly impacted the Bayshore development on the Alsea Spit near Waldport as described above.

While some state leaders will point to Oregon's extensive land use planning process as having remedied these sorts of problems, an examination of the facts show that Oregon's land use planning system has failed miserably in protecting outstanding coastal natural and scenic areas against unwise development. One main problem is the state's "exception process," which allows already designated areas to be excluded from land use goals. A late 1985 survey by the Oregon Department of Land Conservation and Development (DLCD), revealed that 75 percent of all proposed exceptions to Oregon's counties coastal plan have been approved by the State of Oregon (see enclosed list of exceptions approved by Oregon's Land Conservation and Development Commission (LCDC).

Similarily, between 1982 and 1985, Oregon coastal counties adopted over 200 plan amendments, a great percentage enabling additional coastal development. The fact tThat so many ill-advised coastal zone plan amendments and exceptions have been granted, clearly demonstrates that Oregon's Coastal Management Program has done more to provide for the "development", than the "conservation" of Oregon's most environmentally and economically important coastal resources.

Conservationists in Oregon appreciate the effort and investment DOI originally made in inventorying Oregon's and the nation's coastal barriers. ONRC too has contributed substantial time and energy to this process. For all of the above reasons, Oregon and the Pacific Coast should be included in the CBRS. This would provide some protection to valuable aquatic habitats, and also reduce unwise development that would inevitably cost taxpayers many dollars. ONRC requests that DOI expediently release the complete inventory for the Pacific Coast and urges you to recommend to Congress that these wetland barriers be included in an expanded Coastal Barriers Resources System.

Sincerely,

James Monteith
Executive Director

Enclosures

151/coabar

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BOARD OF SUPERVISORS
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COUNTY OF SANTA CRUZ

GOVERNMENTAL CENTER 701 OCEAN STREET SANTA CRUZ CALIFORNIA 95060-4069

DAN FORBUS (FIRST DISTRICT) ROBLEY LEVY (SECOND DISTRICT) GARY A. PATTON (THIRD DISTRICT) SHERRY MEHL (FOURTH DISTRICT) JOE CUCCHIARA (FIFTH DISTRICT)

May 28, 1987

Coastal Barriers Study Group
U.S. Department of Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20023-7127

RE: RESPONSE TO MARCH 25, 1987 FEDERAL REGISTER NOTICE
RELATING TO RECOMMENDATIONS TO CONGRESS WITH RESPECT
TO IMPLEMENTATION OF THE COASTAL BARRIER RESOURCES ACT

Dear Ladies and Gentlemen:

I have reviewed the Federal Register Notice published on March 25, 1987, and am writing to you as suggested in the Notice, to provide my comments on your proposed recommendations to Congress. The Department of Interior has been directed by the Congress to prepare recommendations for implementation of the Coastal Barrier Resources Act of 1982. I am distressed that the recommendations you propose to submit do not recognize the extremely important coastal barriers which exist in the State of California, and which should be included within your report to Congress as areas recommended for protection.

I am most familiar, of course, with potential coastal barrier resource system units located nearby Santa Cruz County. I am personally familiar with potential units CA-29, in Half Moon Bay; CA-30, Waddell Creek, in Santa Cruz County; CA-31, Sunset Beach, in Santa Cruz County; CA-32, Zmudowski Beach, in Monterey County; and CA-33, Moss Landing, in Monterey County. I can tell you, from my personal knowledge of those potential coastal barrier sites, that each one of these areas is extremely worthy of protection. I urge that you revise your recommendations to Congress, and include recommendations that the above listed potential coastal barrier resources system units be given protection under the Coast Barrier Resources Act.

I am generally familiar with other potential coastal barrier resource system units located along the California coast. The Department of Interior has suggested that none of the potential coastal barrier resources units be included within the protected provisions of the Coastal Barrier Resources Act, and this recommendation is just plain wrong. I urge the Department to

revise its recommendations to recognize the extremely significant coastal barrier resources located on the West Coast of this nation, and recommend appropriate inclusions within the system established by the Coastal Barrier Resources Act of 1982.

Thank you for your attention to my strongly felt views in this matter.

Yours truly,

GARY A. PATTON, Supervisor
Third District

GAP:lg

cc: Assembly Member Farr
Senator Mello
Governor Deukmejian

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TONY T. KUNIMURA
MAYOR

AVERY H. YOUN
PLANNING DIRECTOR

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TELEPHONE 808 245 3691

COUNTY OF KAUAI
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May 8, 1987

Coastal Barriers Study Group
U. S. Department of Interior
National Park Service
P. O. Box 37127
Washington, D. C. 20013-7127

Subject: Coastal Barrier Resources Act of 1982

It is our understanding that the Department of Interior has submitted recommendations to Congress regarding the Coastal Barriers Resources Act of 1982 and has determined that additional study is needed before undeveloped coastal barriers in Hawaii can be recommended for inclusion into the program.

Because of the potential impact such a program may have on our land use and infracture planning requirements, it is extremely important that we be kept abreast of any recommendations or changes that may affect the State of Hawaii and more particularly, the islands of Kauai and Niihau.

As we stated in a previous letter to you, we share the same position of our State Government on this matter, in that the proposed Coastal Barrier program does not apply to the State of Hawaii.

Thank you for the opportunity to comment on this matter.

AVERY H. YOUN
Planning Director

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
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1331

FRANK F. FASI
MAYOR

DONALD A. CLEGG
CHIEF PLANNING OFFICER

GENE CONSELL
DEPUTY CHIEF PLANNING OFFICER

KK/DGP 4/87-1317

June 22, 1987

Coastal Barriers Study Group
U.S. Department of Interior
National Park Service
P. O. Box 37127
Washington, D.C. 20013-7127

Gentlemen:

Coastal Barrier Resources Act of 1982

We agree with most of the recommendations of the Department of the Interior (DOI) included in the "Draft Report to Congress: Coastal Barrier Resources System, Executive Summary." We do feel, however, that the Coastal Barrier Resources System (CBRS) land acquisition recommendation on page 16 of the Executive Summary should go a little further in ensuring protection of CBRS lands. CBRS lands acquired by Federal, State or local agencies and lands which are presently owned by Federal, State, or local agencies, which if privately owned would be considered CBRS lands, should not be sold to any private interests. These lands should remain in government ownership to offer the protection necessary for these sensitive environments.

We also recommend a more aggressive approach to encouraging CBRS private landowners to donate their properties for conservation or conservation easement purposes. The first three proposed amendment items discussed on page 16 of the Executive Summary should be supported. These amendments to the Tax Treatment Act of 1980 and Coastal Barrier Resources Act of 1982 would provide greater incentive for private owners to donate their lands for public (conservation) purposes.

Thank you for the opportunity to offer our comments.

Sincerely,

DONALD A. CLEGG
Chief Planning Officer

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NEW ENGLAND GOVERNORS' CONFERENCE, INC.

76 Summer Street, Boston, Massachusetts 02110 617 423-6900
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July 2, 1987

The Coastal Barriers Study Group
National Park Service
United States Department of
the Interior
Post Office Box 37127
Washington, DC 20013-7127

Dear Members of the Study Group:

I write as Chairman of the New England/New York Water Council, an advisory committee of the New England Governors' Conference, Inc. on water resource matters. At its May 6, 1987 meeting, the Council reviewed the Executive Summary of the draft "Report to Congress: Coastal Barrier Resources System". Our comments follow.

The Council strongly supports the Coastal Barrier Resources Act, and its goal of protecting fragile coastal barriers from unwise development. In many cases, such development would not occur without the federal flood insurance and other federal development assistance.

In our region, 90 units have been designated for inclusion in the Coastal Barriers Resources System. The 127.6 miles of shoreline and 30,730 acres affected clearly benefit from such designation and from the non-availability of federal development subsidies.

The New England/New York Water Council endorses the thrust of the proposals presented in the draft report, and urges the U.S. Department of the Interior to pursue this matter aggressively with the Congress. We recommend, however, that four specific changes be made. These are:

1. Coastal barriers that are considered "otherwise protected", because they are owned by a governmental agency or a non-profit conservation organization should be included in the Coastal Barrier Resources System. The Secretary of the Interior had previously recommended that such "otherwise protected" barriers be included in the system. The 1987 draft report is vague on this point (pages 9-12) but the recommended additions, deletions, and modifications show that this recommendation has been dropped.

The reality is that the intentions of a governmental agency or private organization can change over time. A coastal barrier, the major portion of which is owned by any of these entities, may be protected today but sold in the future.

A formal review procedure should be established to apply criteria to determine whether an "otherwise protected" barrier is eligible for inclusion in the system. Such criteria should include:

- the activity can be accommodated on the barrier without significantly impeding geomorphic or ecologic processes;
- structures be located or relocated landward of the primary dune;
- structures be located in zones on the barrier that have the greatest long term stability; and
- demonstration be made to show that the structure is necessary and provides a significant public benefit.

Such procedures and criteria should be incorporated in CBRA by amendment.

2. Many coastal barriers are currently intensively developed, and do not meet the criteria for designation at this time. Future storms or other events will inevitably change many of these to an undeveloped condition. Neither Federal development assistance nor the National Flood Insurance Program should help replicate past mistakes. All developed coastal barriers should be identified as soon as possible, and a procedure established for the addition of these areas to the Coastal Barrier Resources System at the time that conditions change.

3. A mechanism should be established to provide continuous, ongoing oversight of the implementation of the Coastal Barriers Resource Act, including the review procedure recommended above.

4. Coastal barrier land forms located on the Great Lakes should be included in the Coastal Barrier Resources System as previously recommended by the Secretary. Of the five criteria initially used to identify coastal barriers only one, that they be subject to tidal energies, is not met by the Great Lakes barrier system. This is not a major factor and, in fact, the average annual variation in water levels in the Great Lakes is greater than the tidal variation in some sections along the marine coast. Without the protection afforded the remaining such areas under the CBRA, and with continued Federal incentives to develop and utilize them they will continue to disappear at an ever increasing rate. State and local governments can not hold out against the many pressures for development without the partnership of the Federal government.

We recognize that implementation of these proposals will require some effort. This burden need not fall entirely on the Department of the Interior. Each coastal state has designated a lead agency for implementation of Section 10 of CBRA, and this agency (or another if necessary) could perform all of the field work, and much of the other work required to accomplish the intent of these recommendations.

The representatives of the seven states that comprise the New England/New York Water Council of the New England Governors' Conference, Inc. unanimously urge your acceptance of these recommendations.

Sincerely,

Bernard A. Johnson

Bernard A. Johnson
State of Vermont
Chair
New England/New York Water Council

1381

COMMENTS

OF

THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

ON

DEPARTMENT OF THE INTERIOR

PROPOSAL TO CONGRESS

FOR AMENDMENT

OF

THE COASTAL BARRIER RESOURCES ACT

SUBMITTED BY:

RAE E. CRONMILLER
ENVIRONMENTAL COUNSEL
ENERGY AND ENVIRONMENTAL
POLICY DEPARTMENT, NRECA

JUNE 29, 1987

Comments
of
The National Rural Electric Cooperative Association

The National Rural Electric Cooperative Association (NRECA) submits these comments in response to the Department of the Interior (DOI) notice and request for comment to its proposed recommendations to Congress for Coastal Barrier Resources Act (CBRA) amendments, 52 Fed. Reg. 9618. Section 10 of the CBRA mandates that DOI make a report on the Coastal Barrier Resources System (CBRS), designated geographic areas under the CBRA, and on other aspects of the CBRA. NRECA's response addresses the Executive Summary of the draft report distributed by the DOI in March 1987 and referenced in the notice. NRECA supports efforts to preserve the nation's coastal barriers and associated resources and appreciates this opportunity to comment on the draft report to Congress.

The NRECA membership includes many consumer-owned, not-for-profit rural electric cooperatives located along the Atlantic and Gulf Coasts that obtain loans for facilities construction under the Department of Agriculture Rural Electrification Administration (REA) Secured Loan Program. The cooperatives serve many sparsely populated areas located in or around lands designated in the CBRS, thus they are substantially affected by CBRA restrictions on federal "financial assistance" for activities within the CBRS.

Several important factors distinguish the rural electric cooperatives from other entities also restricted from obtaining "federal assistance" under the CBRA. First, cooperatives must serve some CBRS areas under state law. Since they are consumer-owned and have little equity, the REA loan program is the only practical source of funding. The CBRA does not preempt these state mandatory service requirements for cooperatives, rather it only operates to strip them of the only available funding source. Second, as the CBRA legislative history points out, the construction of electric utility transmission and distribution lines follows development, not precedes it, H.R. Rep. No. 841, Part 1, 97th Congress, 2nd Sess, p. 9 (1982), (hereinafter cited as House Report). Conversely, the automobile transportation system for which federal grant not loan money has traditionally been available always spearheads development. It, therefore, is only necessary to curb highway development to stop human encroachment on coastal barriers. Third, the "federal assistance" monies lent to the electric cooperatives under the REA loan program are paid back in full, even if the value of constructed facilities are prematurely reduced by storm. Since no federal funds are at risk of loss under the REA program, a major goal of the CBRA to avoid such risk is achieved whether or not provisions of the CBRA are applied to the electric cooperatives (see Executive Summary, p. 6).

The objectives of our comments are twofold: (1) to ensure that the CBRA functions to preserve undeveloped coastal barriers and associated areas without causing undue hardship, and (2) to enable the nation's rural electric utilities to continue to provide electric service to developed areas within and around the CBRS even when additional areas having existing electric facilities are retroactively incorporated into the CBRS. We emphasize that the Congress itself deems the denial of "federal assistance" to developed communities within the CBRS as inequitable (House Report, p. 13).

I. Section 6(a)(3) allowing expenditures for existing facilities that are essential links in a larger system should be retained.

DOI recommends the elimination of this section because at least one federal agency classified all its associated projects as essential links in a larger system, thereby obviating additional consideration of whether a particular project is consistent with the CBRA (Executive Summary, p. 18).

We think all the exceptions in Section 6 are necessary for the proper function of the CBRA. It is these exceptions which avoid undue hardships and inequities on those living within or around CBRS areas particularly those that located before CBRA enactment. Section 6(a)(3) even under broadest interpretation allows only the maintenance of existing services. Eliminating 6(a)(3) leaves only the 6(a)(6)(F) exemptions which are based on the vague principle of consistency with CBRA purposes. Section 6(a)(3), on the other hand, invokes a definite, useful standard necessary for proper application of the CBRA. Because one agency has seemingly overapplied the standard is hardly adequate reason to eliminate the entire section.

The Section 6(a)(3) essential links exception would become even more vital if, as DOI recommends, Congress expands the CBRS to include all wetlands, other aquatic habitats and secondary barriers associated with coastal barriers (see the Executive Summary, p. 9). Primary existing transmission lines supplying electricity to communities along the coasts would retroactively be situated within the CBRS. These lines are clearly essential links to the smaller distribution lines serving existing coastline and island communities. As such, they should be specifically exempt from CBRA prohibition on maintenance, repair or reconstruction. Vague principles of "CBRA consistency" specified in Section 6(a)(6)(F) are subject to varied and wide interpretation and, therefore, should not serve as the sole determination for federal assistance eligibility.

II. There is no administrative authority implied or expressed in the CBRA that allows DOI to restrict federal assistance to projects located outside the CBRS that have an indirect effect on coastal barrier development.

NRECA agrees with DOI that CBRA legislative history does not address whether "federal assistance" for a project affecting CBRS development can be prohibited under the Act, even though the project is situated outside CBRS boundaries (see Executive Summary, p. 18). But we disagree with DOI's contention that it can read into the Act authority to prohibit such projects. The reason legislative history does not mention indirect effects prohibition is because the language of Sections 5 and 6 is clear on its face. Sections 5 and 6, respectively, prohibit and under special circumstances allow federal assistance for projects or purposes within the CBRS. Authority to restrict "federal assistance" for projects incidentally or indirectly affecting the CBRS while located outside the CBRS is conspicuously lacking.

III. Federal Assistance for public services to military facilities and recreational areas should be expressly allowed.

Congress realizes the importance of essential military activities within the CBRS as evidenced by the Section 6(a)(4) exemption to the federal assistance prohibition. The House report also shows Congress deemed recreational activities such as hunting, fishing, camping, swimming, etc. to be important and acceptable coastal barrier uses (House Report, p. 9).

Absent from the CBRA or the legislative history, however, is the mention of federal assistance for services supporting these activities. Although authority for continuing such services is indirectly found in Section 6(a)(6)(F), NRECA recommends Section 6 be amended to specifically allow federal assistance for projects supporting recreational and military activities.

1330

ASSOCIATION OF STATE FLOODPLAIN MANAGERS, INC.

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June 23, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Gentlemen:

The Association of State Floodplain Managers appreciates the opportunity to comment on the final Draft Report to Congress on the Coastal Barrier Resources System (CBRS).

The Association is a nationwide organization founded in 1977 by professionals in state government responsible for floodplain management; flood hazard mitigation; flood preparedness, warning, and recovery; and the National Flood Insurance Program. We now have many members from local and federal governments as well as the private sector who are actively involved.

The primary purposes of the Association are: 1) to provide national representation for states and locals with regard to policies and actions occurring in areas of flood hazard management; 2) to facilitate cooperation and exchange of information among state, local, federal, and private officials in innovative ideas and trends in floodplain management; and 3) to provide a forum for the education of those involved in floodplain management.

The Association supported the passage of the Coastal Barrier Resources Act (CBRA) in testimony presented in 1981 and submitted written comments on the initial Draft Report to Congress released in April, 1985.

With that in mind the Association wishes to offer the following comments regarding the recommendations proposed by the Department of Interior (DOI) in the final Draft Report. The comments are made in the order that the recommendations appear in the report. Please note that the Association is refraining from commenting on the Draft Maps as it feels that such comment is more appropriately left to the individually affected states and property owners.

PROPOSED RECOMMENDATIONS FOR ADDITIONS TO OR DELETIONS FROM THE CBRS

A. Geographic Scope

Proposed recommendation: DOI proposed that the undeveloped, unprotected coastal barriers of the Florida Keys, Puerto Rico and the Virgin Islands be added to the CBRS.

COMMENT: The Association supports this recommendation and further recommends that the undeveloped, unprotected coastal barriers of the Pacific Coast, Great Lakes, Alaska, Hawaii and American Samoa also be added to the CBRS. The natural forces which shape coastal barriers affect all U.S. shorelines. All coastal barrier landforms in the U.S. perform similar functions in protecting landward aquatic habitats and mainland areas from the impacts of coastal storms. This protection is ecologically and economically valuable regardless of whether the waves originate in the ocean or in a lake or embayment. In the interest of equity there is no reason why the Act should be limited in geographic scope.

B. Associated Aquatic Habit

Proposed recommendation: DOI proposes that all of the aquatic habitats associated with existing CBRS units be added to the CBRS. This definition reflects the specific conservation purposes of CBRA to protect the fish, wildlife, and other natural resources of coastal barriers. All such associated aquatic habitats are inseparable parts of the coastal barrier ecosystem.

COMMENT: The Association supports this recommendation as written.

C. Secondary Barriers

Proposed recommendation: DOI proposes that secondary barriers be added to the CBRS.

COMMENT: The Association supports this recommendation with the understanding that the arguments for extending the geographic scope of coverage to coastal barriers beyond the Atlantic and Gulf coasts in A. above should apply as well to secondary barriers in large well-defined embayments in those areas (e.g. Puget Sound).

D. "Otherwise Protected" Coastal Barriers

Proposed recommendation: DOI proposes that all privately owned property within a conservation or recreation area established by Federal, State, or local law on an undeveloped coastal barrier (inholding) be included by reference in the CBRS. DOI also proposes

that privately owned undeveloped coastal barriers held for conservation purposes be automatically included in the CBRS if the not-for-profit owner ever proposes to sell the property for development that is inconsistent with the long-term conservation of the barrier. An amendment to CBRA providing a legislative directive to DOI to develop guidelines for such acceptable development is necessary. These guidelines would be similar to the Secretary's Standards for Historic Preservation utilized to certify Historic Preservation Tax Credits. Lack of safeguards or long-term plans in selling the land would constitute justification for automatic inclusion in the CBRS.

COMMENT: The Association still recommends that all "otherwise protected" areas should be held in the same standards as private property and therefore be included into the CBRS. Exclusion of protected areas raises the question of unequal treatment of undeveloped coastal barriers. If areas are truly protected, there is no reason to allow federal subsidies for activities that conflict with the purposes of the Act.

While the Association would prefer that all "otherwise protected" areas be included into the CBRS, it realizes that the privately owned lands are most threatened by development pressures and therefore most in need of protection. With this in mind the Association supports DOI's recommendation in lieu of the current situation of total exclusion of "otherwise protected" coastal barriers.

PROPOSED CONSERVATION RECOMMENDATIONS

A. Federal Stewardship the Acquisition Alternative

Proposed recommendation: DOI proposes that the Federal Government continue to employ the user fee concept in acquisition of CBRS lands as appropriate. DOI also proposes that State, and local land-managing agencies be encouraged to pursue acquisition of CBRS lands as appropriate. If any CBRS lands are added to a conservation/recreation unit managed by a government agency, these lands would automatically become exempt from CBRA's restrictions. DOI also proposes that the areas currently included in the CBRS on military and Coast Guard lands be deleted. In addition, DOI proposes that if at some time in the future these, and any other Federal coastal barrier properties, are determined to be excess/surplus to government needs, the portions of such properties which GSA, in consultation with DOI, determines are appropriate for inclusion in the CBRS would be included in the CBRS prior to disposal unless they otherwise qualify for exemption under the law.

COMMENT: The Association supports the Federal employment of the user fee concept and the encouragement of State and local participation in the acquisition of CBRS lands. The Association also supports the inclusion of appropriate surplus Federal lands in the CBRS prior to disposal. The Association opposes the exemption from CBRA's restrictions of lands added to a conservation/recreation unit managed by a government agency or of any excess/surplus Federal lands to the extent of its comments on "otherwise protected" coastal barriers. The Association also opposes the deletion of all military and Coast Guard lands from the CBRS. While it is DOI's "understanding that most military activities along the Atlantic and Gulf coastlines are essential to National security" (and therefore exempt from the provisions of CBRA), the Defense Department's proposal to construct an officer's club on the Onslow Beach unit in North Carolina illustrates that not all defense spending is necessary for National security and that military coastal barriers need protection from unnecessary development as much as privately owned coastal barriers.

B. Regulatory Consistency

Proposed recommendation: The DOI finds that the major Federal permit programs that affect the CBRS--permits for dredge and fill and bridge construction--take fish and wildlife values into account. Requiring regulatory consistency at the Federal level would depart from the basic CBRA premise that conservation can be achieved without increasing Federal regulatory involvement, by simply withdrawing Federal financial support for development of undeveloped coastal barriers. Furthermore, most States have additional regulatory safeguards that also serve construction setback requirements, and poststorm reconstruction policies to control development on barriers. Therefore, DOI recommends no regulatory amendment.

COMMENT: The Association supports this recommendation as written.

C. Tax Policy Alternatives

Proposed recommendation: We recommend no tax amendments at this time.

COMMENT: The Association has no specific position on any of the various tax policy alternatives considered but in general supports options that either reduce the incentive to develop or increase the incentive to conserve coastal barriers and which are consistent with the conservation, fiscal and health and safety goals of CBRA.

D. Other Amendments to CBRA

1. Section 5

Proposed recommendation: Although CBRA and its legislative history do not speak directly to this issue, DOI concludes that Federal financial assistance specifically directed to a purpose within a CBRS unit is prohibited by CBRA. DOI will develop guidance with Federal agencies that will clarify our understanding that Federal funding for a facility located outside a CBRS unit whose direct purpose is to provide a tangible product within the CBRS unit (water, electricity, etc.) is restricted by CBRA.

COMMENT: The Association supports this recommendation as written.

2(a) Section 6 Essential Link

Proposed recommendation: DOI proposes that Section 6(a) (3) be deleted. Maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly-owned or publicly-operated roads, structures, or facilities would continue to be allowed under Section 6(a) (6) (F) provided they are consistent with the purpose of CBRA.

COMMENT: The Association supports this recommendation as written.

2(b) Section 6 Dredged Material Disposal

Proposed recommendation: DOI proposes that Section 6(a) (2) be amended to insert after the word "improvements" the phrase "which shall be performed in a manner consistent with the purposes of this Act", so that it would read: "the maintenance of existing channel improvements and related structures, such as jetties, and including the disposal of dredged material related to such improvements, which shall be performed in a manner consistent with the purposes of this Act".

COMMENT: The Association supports this recommendation as written.

2(c) Section 6 Recreational Projects

Proposed recommendation: DOI proposes no amendment to Section 6(a) (6) (A). The term "recreational project" is not ambiguous; further clarification, if needed, can be supplied by this Department upon request.

COMMENT: The Association supports this recommendation as written.

2(d) Section 6 Technical Assistance

Proposed recommendation: DOI proposes no amendment to Section 3(3). The term "technical assistance" is generally considered as a form of "indirect Federal assistance" as listed in Section 3. Further clarification, if needed, can be supplied through Departmental guidelines.

COMMENT: The Association supports this recommendation as written.

2(e) Federal Agency Compliance

Proposed recommendation: DOI proposes no amendment to address block grants. The Department believes most agencies have incorporated compliance with CBRA into regular program activities. For instance, the Department of Housing and Urban Development requires recipients to comply with the purposes of CBRA. The benefits derived from amending the law to require Federal agencies responsible for disbursing Federal funds to States and localities to establish coordinated tracking systems to monitor and assure compliance with CBRA would be outweighed by the costs of implementation.

COMMENT: The Association opposes this recommendation. Federal agencies should be required to account for their granting of block grants or other actions, assuring that the actions are consistent with CBRA.

3. Section 7

Proposed recommendations: DOI proposed that Section 7 be deleted from CBRA. All Federal agencies comply with CBRA. There is no reason to expect that such compliance will not continue. Continued compliance can be ensured through Departmental and Congressional auditing and oversight. The annual certification requirements, therefore, is unnecessarily burdensome.

COMMENTS: The Association strongly opposes this recommendation. Presently there is little, if any, oversight of federal agency actions to determine if they are consistent with CBRA.

Currently compliance with CBRA's consultation requirements rests with each federal agency and in particular, with the federal officer responsible for the proposed expenditure. Upon consultation DOI provides technical information and a written opinion. Regardless of the opinion the final determination of whether an action is permitted rests with the consulting federal agency. DOI has no enforcement

authority and cannot prevent assistance to a project believed to be beyond the scope of the exceptions. Outside monitoring of this process is difficult because there is no requirement for public notice of proposed expenditures under the Section 6 exceptions. Section 7 of the CBRA requires the Office of Management and Budget (OMB) to make annual certification that each agency has complied with the provisions of CBRA during the fiscal year. OMB's certification, however, relies on the statements of each federal agency.

The Association believes the above shortfalls create a potential for abuse of the exceptions process. Consequently, the Association recommends adoption of a requirement that a consulting federal agency consider DOI's comments and recommendations and provide a written explanation when differing with them before proceeding. Finally, the Association supports the establishment of a procedure to notify the public, State Coastal Zone Management Offices and Congress of proposed expenditures under the Section 6 exceptions and consultation process. Such notification would allow outside comment on the proposed action and, if necessary, pursuit of legal or legislative action to prevent the expenditure.

E. Conservation of Atlantic and Gulf Coast Barriers: The Next Step

Proposed recommendation: DOI proposes that a joint study be undertaken by DOI, DOD, FEMA and NOAA to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers following major storms or hurricanes. The existing policy of simply replacing the structures that have been damaged or destroyed does not consider the special risks associated with development on coastal barriers. Additional efforts in public education could also help coastal barrier residents and government officials make these difficult decisions in an informed manner.

COMMENT: The Association strongly supports this recommendation.

The expenditures limitation approach of CBRA removes federal economic incentives for development and other resource damaging activities on coastal barriers while avoiding many of the political and legal problems of traditional government efforts. Because this is in keeping with the Association's goals of sound floodplain management it previously supported passage of CBRA.

The Association of State Floodplain Managers now welcomes this opportunity to participate in the review of the final Draft Report to Congress on the Coastal Barrier Resources System. We hope our comments and recommendations will be helpful in the process of evolution and improvement of the Coastal Barrier Resources Act.

Sincerely,

Dante C. Accurti
Chair

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Working for the Nature of Tomorrow

NATIONAL WILDLIFE FEDERATION
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Coastal Barriers Study Group
Department of the Interior
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127

RE: Comments on the Coastal Barrier Resources Act--Section 10 Draft Report to Congress, 52 Federal Register 9618-9619

Dear Sir or Madam:

The National Wildlife Federation, the Natural Resources Defense Council, the Coast Alliance, and the Oceanic Society are writing in response to the Department of the Interior's Federal Register Notice of March 23, 1987 solicitng comments on the Draft Report to Congress: Coastal Barrier Resources System--Executive Summary.

Our organizations have a longtime interest in the conservation of coastal barriers. The Natural Resources Defense Council was the founding organization of the Barrier Islands Coalition in 1978. Likewise, the National Wildlife Federation, the Coast Alliance, and the Oceanic Society became members of that coalition in 1979 to help seek protection of coastal barriers.

Our organizations have led efforts to pass legislation which would conserve the natural resources of coastal barriers--first, the flood insurance prohibition in the Omnibus Reconciliation Act in 1981 and then, the Federal financial prohibition in the Coastal Barrier Resources Act (CBRA) in 1982. We continue to support the goals of CBRA and expansion of the Coastal Barrier Resources System (CBRS) throughout the United State and its territories. The federal government should not be subsidizing development in hazardous areas which destroys productive coastal ecosystems, endangers the lives and properties of shoreline residents, and costs federal taxpayers millions of dollars each year in flood insurance claims and disaster relief.

The need for an expanded Coastal Barrier Resources System in which federal development subsidies are prohibited is becoming increasingly critical in light of the projected rise in sea levels due to global warming. As water levels rise, so will the costs of protecting existing structures, the damages from erosion and flooding, and the risk to human life and property. Unfortunately, however, development in these unstable coastal areas continues to grow at a frightening pace. We feel strongly, therefore, that it is essential that the Department recommend maximum expansion of the System to include the eligible areas on all of America's coasts

before these sites are irrevocably committed to development. An appendix of specific comments on additions to and deletions from the System follow our general comments.

PROPOSED RECOMMENDATIONS FOR ADDITIONS TO OR DELETIONS FROM THE CBRS

We support the Department's recommendation to expand the definition of a "coastal barrier" to include landforms which function as coastal barriers in protecting the mainland and adjacent aquatic habitats, even if they are not composed of unconsolidated sediments as are barriers in the traditional definition. Use of this expanded definition in delineating CBRS units is consistent with the conservation goals of CBRA and would allow for the inclusion of such new geological formations as undeveloped beach rock, cemented dunes, fringing mangroves and associated coral reefs, cheniers, discontinuous outcrops of bedrock, and coarse glacial deposits. Since these areas serve the same function as coastal barriers and are as vulnerable to development pressure, sea level rise, and storm damage as traditionally-defined coastal barriers, it is appropriate that they also be protected within the System.

A. Geographic Scope

We commend the Department on the excellent job of inventorying potential units and recommending additions to the System, and are very pleased with its recommendations to expand the area of the System by 323% on the Atlantic and Gulf coasts. We also strongly support the Department's recommendation to include, for the first time, the undeveloped coastal barriers of the Florida Keys, Puerto Rico and the U.S. Virgin Islands. As these areas all boast valuable and unique environmental resources and, at the same time, are subject to intense development pressure, protection of their undeveloped barriers within the System is essential.

We believe the Department has erred, however, in deciding not to recommend the inclusion of Great Lakes and Pacific coastal barriers within the System. The barriers of these coasts, like those protected in the System along the Atlantic and Gulf coasts, are primarily composed of unconsolidated sedimentary materials, provide protection to the mainland and adjacent coastal wetlands, and are vulnerable to erosion, water level rise, flooding, and storm damage. Inclusion of the Great Lakes and Pacific coasts would be consistent with the Act's goal of preventing the destruction of fragile coastal ecosystems, as well as the Interior's proposed expanded definition of a "coastal barrier" to include landforms that function as coastal barriers. If landforms as different from a traditionally-defined Atlantic or Gulf coastal barrier as a coral reef is to be included within the System, then the minor geological differences between the coastal barriers of the Great Lakes or Pacific coasts and those of the Atlantic or Gulf coasts should not be an obstacle to including the Great Lakes and Pacific coasts within the System.

On the Great Lakes coast, inclusion of appropriate areas within the System also would help reduce future flood and erosion problems

when there are record-breaking water levels once again. Although the Pacific coast currently is not experiencing a crisis which makes the need for coastal protection so urgently apparent, past costs and destruction from winter storm damage make inclusion of this coast within the System prudent to anticipate future problems. We urge the Department to reconsider its position and recommend the inclusion of appropriate areas along both the Great Lakes and Pacific coasts. At the minimum, we request the release of revised maps for these areas so adequate comments can be made.

B. Associated Aquatic Habitat

We endorse the Department's recommendation to add all aquatic habitats associated with existing CBRS units. The Act specifically incorporates in its current definition of a "coastal barrier" all associated aquatic habitats, so inclusion of these areas is both appropriate and necessary to fulfill the requirements of the Act. Coastal barriers and their valuable associated aquatic habitats function as a single ecosystem, making preservation of both areas necessary to achieve adequate coastal protection.

C. Secondary Barriers

Although secondary barriers of large embayments such as Chesapeake and Narragansett Bays are subject to internally-generated tidal energies rather than the externally-produced wind, wave and tidal effects experienced by primary barriers, they are formed from the same unconsolidated sedimentary materials and serve the same protective function for the mainland and adjacent wetlands. Secondary barriers also provide vital habitat for some of the nation's most commercially and recreationally important fish and shellfish species, including blue crab, oysters, clams, and shrimp. As a result, it is fitting that they should be protected within the System and we strongly support the Department's recommendation to include them.

D. "Otherwise Protected" Barriers

We support the Department's recommendation to include all private inholdings in otherwise protected areas, as well as land held for conservation purposes if it is sold for development. A Congressional directive to the Department to establish guidelines outlining what constitutes development which is consistent with CBRA will be necessary in order to accomplish this.

While we agree with the Department's emphasis on recommending inclusion of inholdings and conservation lands later sold for development, we believe that all eligible "otherwise protected" areas also should be included within the Sytem. The "otherwise protected" status given to federal, state and local lands does not guarantee that federal funds will not be used to develop these lands in ecologically-damaging ways. There are several illustrative examples of the danger of making this assumption. In New England a few years ago, the U.S. Fish and Wildlife Service had to be convinced in a lengthy confrontation to move the site of their new headquarters and visitors center from the Parker River National Wildlife Refuge on Plum Island, a fragile barrier island not appropriate for such

development, to an off-island location. Recently in Texas, the Land Commissioner attempted to make the Brazos Island State Park available to developers. In Maryland, the Assateague Island National Seashore is proposing to spend millions of dollars on a beach nourishment project even though it will abate only temporarily Assateague's severe erosion problem, and, primarily, benefit developers on the mainland's floodplain. Inclusion of these "otherwise protected" areas within the System would grant them the higher standard of protection found under CBRA and would guarantee that no federal monies could be spent on damaging projects within them.

We feel strongly that the Department should recommend the inclusion of "otherwise protected" areas within the System. The Department's highest priority, however, should be recommending undeveloped, unprotected additions to the System along the Atlantic and Gulf coasts and expanding the System to include the undeveloped, unprotected barriers on the Great Lakes and Pacific coasts.

PROPOSED CONSERVATION RECOMMENDATIONS

A. Federal Stewardship: The Acquisition Alternative

Acquisition of coastal barriers by agencies of the federal government for conservation purposes provides the most reliable protection for coastal barriers against unwise development. Given current budgetary constraints and intense competition for acquisition money, it is imperative that the Department develop a priority system for acquisition of CBRS units where the need is greatest. The Land and Water Conservation Fund is currently being proposed for reauthorization at a higher level of funding and from a more stable funding source. Development of a priority system would prepare the Department to acquire CBRS lands as soon as this funding becomes available. Criteria for ranking areas should include threats to habitat, diversity of fish and wildlife resources, importance of wildlife habitat and availability of alternative habitat, whether or not CBRA is providing adequate protections against development pressures, projected losses to sea level rise, and the presence of endangered species.

State and Local Acquisition: We agree with the Department that state and local land-managing agencies should be encouraged to pursue acquisition of CBRS lands and develop effective post-storm redevelopment regulations which would discourage the reconstruction of structures in hazardous areas. States also should be encouraged to develop state level coastal barrier resource systems to reduce state subsidized development of coastal barriers.

Military and Coast Guard Lands: We adamantly oppose the deletion of military and Coast Guard lands from the System. The Department of Defense's stance that all development on these lands is "essential to national security" has been used wrongly to justify the construction of unnecessary structures in fragile, unstable coastal areas, such as an officers beach house on the Onslow Beach unit in North Carolina. Military- and Coast Guard-owned coastal barriers are just as vulnerable to flooding, storms, and erosion as other coastal barriers, and are in equal need of protection from

unnecessary damaging development. Unlike other government-owned land such as "otherwise protected" areas, the primary purpose of military land is not conservation of natural resources and, as a result, CBRS designation is needed as a guide for acceptable development on these lands.

We urge the Department to be consistent in applying CBRS restrictions on public and private lands alike by dropping its recommendation to delete military and Coast Guard lands from the System.

Excess Federal Property: We support the Department's proposal in its 1987 Draft Report that when federal coastal barrier properties are found to be surplus to government's needs, they should be included in the CBRS if they qualify.

B. Regulatory Consistency

As outlined in the Department's 1985 draft report, several federal agencies, including the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and the U.S. Coast Guard, administer
programs which are not required to comply with the purposes of CBRA and therefore can permit activities which work at cross-purposes to the Act by encouraging development and destroying coastal resources. In particular, we are concerned about the impact of the permitting activity of the Army Corps of Engineers under Section 404 of the Clean Water Act. Dredging, filling, and bulkheading, especially in wetlands and shallow waters, can have significant detrimental impacts on the natural resources of coastal barriers. Section 404 permits for these activities in wetlands rarely are denied by the Corps. We believe it is very important to restrict such activities unless they are consistent with the purposes of the Act.

The most effective option proposed by the Department in its 1985 draft report to accomplish this is to initiate legislation to prohibit federal agencies from issuing permits for activities on or adjacent to coastal barrier units unless the agency finds, in consultation with the Fish and Wildlife Service, that the proposed activity would be consistent with the purposes of CBRA. This option would help ensure that permits are issued only for activities that further the conservation of coastal barriers and their resources. We strongly recommend that the Department adopt this option as its recommendation to Congress on federal regulatory programs.

In addition, shore protection projects adjacent to or near a CBRS unit can accelerate erosion and destroy barrier ecosystems within the unit. We request the Department to recommend that the Army Corps of Engineers be required to consider the impact of structures on nearby coastal barrier units before undertaking any shoreline protection projects.

C. Tax Policy Alternatives

Prior to the 1986 Tax Reform Act, tax law catered to the developer, often encouraging unwise investment on flood and erosion-prone land. The new tax law, however, was very useful in reducing these subsidies, so that development on naturally dynamic

erosion-prone land. The new tax law, however, was very useful in reducing these subsidies, so that development on naturally dynamic land like coastal barriers is not automatically subsidized by government tax breaks. However, it was neither complete nor thorough in eliminating all such tax breaks. In particular, the two major loopholes which still exist are casualty loss deductions and preferential treatment of industrial development bonds.

Casualty loss deductions make hazardous development on our coastal barriers economically justifiable because property owners can deduct the cost of storm and erosion damages which exceeds ten percent of adjusted gross income. Removal of this deduction would place the risk of building in the CBRS on individuals' shoulders rather than the taxpayers' and federal government's.

Industrial development bonds are tax-exempt state and local bonds that often are used to finance initial development. The income from such bonds generally is not included in gross income. In order to foster tourism and development, numerous coastal states and communities issue tax-exempt securities for bridges, roads, and other infrastructure. Further restrictions on the availability of tax exempt bonds for such infrastructure is necessary if tax law is to be consistent with CBRA.

We urge the Department to recommend the elimination or substantial reduction of casualty loss deductions for losses incurred on properties within CBRS units and to eliminate tax exempt bonds for infrastructure on CBRS units.

D. Recommendations for Other Amendments to CBRA

1. Section 5

We strongly endorse the Department's interpretation of Section 5(a) of CBRA. Roads, bridges and sewer treatment plants built outside of a CBRS unit can lead to exponential private development growth within the unit by significantly lowering the cost of bringing infrastructure into the unit. In order to achieve the conservation goals of CBRA, federal funding should be prohibited for any project outside of a CBRS unit if it serves to benefit and encourage the development of that unit. Guidelines should be developed by the Department in order to clarify this interpretation for federal agencies.

2. Section 6

(a) Essential Link

We concur with the Interior Department on their recommendation to delete Section 6(a)(3) from CBRA. We feel that the Department of Transportation's interpretation of all federal highways as "essential links" in the federal highway network and therefore eligible for federal funding is a misinterpretation of Section 6(a)(3) and detrimental to the achievement of adequate coastal protection. The maintenance, repair, replacement, and reconstruction of roads, structures, or facilities with federal funding should be allowed only if it is consistent with the purposes of CBRA.

(b) Dredged Material Disposal

The disposal of dredged materials, which currently occurs

without consideration for the goals of the CBRA, has proven to be very damaging to fragile coastal ecosystems and at odds with the coastal protection intended under CBRA. We support the Department's proposed amendment to Section 6(a)(2) of CBRA which would require the maintenance of existing channel improvements and related structures and disposal of dredged materials to be performed in a manner consistent with the purposes of CBRA.

(c) Recreational Projects

The use of the term "recreational project" in Section 6(a)(6)(A) of CBRA clearly states that recreational projects are exempt from the federal funding prohibition under CBRA if they are undertaken in a manner consistent with the Act. We feel no amendment to Section 6(a)(6)(A) is necessary and that any further clarification can be supplied by the Department.

(d) Technical Assistance

We agree with the Department's interpretation of the term "technical assistance" in Section 3(3) of CBRA as a form of "indirect Federal assistance" which would be prohibited within CBRS units under the Act. Any futher clarification of this point should and can be supplied by the Department--no amendment to the Act is necessary.

(e) Federal Agency Compliance

See Comments in Section 7 on OMB Certification.

3. Section 7

We agree with the Department that the current OMB certification process is inadequate because OMB claims that it does not have the capability to audit agency expenditures. We feel strongly, however, that since achievement of the CBRA's goals is dependent on full compliance by all federal agencies, some form of annual reporting is essential to the functioning of the Act. Rather than deleting the reporting requirement, we suggest that Congress direct the General Accounting Office (GAO) to do the annual certification instead of OMB. GAO is experienced in examining federal programs and their efficacy and could do an annual sample of agency spending to look at general compliance to CBRA. Such an annual report by GAO also could include tracking a sample of block grants to insure they were disbursed according to the requirements of CBRA.

E. Conservation of Atlantic and Gulf Coastal Barriers: The Next Step

We endorse the Department's proposal for a joint study to be undertaken by DOI, DOD, FEMA, and NOAA in order to develop guidelines on the redevelopment of coastal barriers following major storms and hurricanes. This study should take into account increased storm damage consequences from higher sea levels resulting from global warming. The current policy of reconstruction of storm-damaged structures is self-defeating because it simply recreates the problem that CBRA attempts to address. Additional efforts to educate the public about the hazards of coastal barrier development also would help facilitate wise decisionmaking about post

storm reconstruction. We also urge the Coastal Barriers Study Group to develop criteria outlining the level of damage required to declare an area undeveloped and eligible for inclusion within the System.

Sincerely,

Sharon Newsome

Sharon Newsome
National Wildlife Federation

Lisa Speer
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The Oceanic Society

APPENDIX

COMMENTS ON SPECIFIC COASTAL BARRIER AREAS

The National Wildlife Federation, the Natural Resources Defense Council, the Coast Alliance, and the Oceanic Society endorse the inclusion of all undeveloped coastal barriers identified by the Department of Interior in the March 1985 inventory, as well as some additional areas mentioned below. Following are our comments on some of the specific areas.

Maine

Although almost 50% of Maine's population is already located along the coast, Maine's Coastal Advisory Committee predicted in its April 1985 Coastal Priorities Statement that the state's coastal population will increase over three times faster than that of the rest of the state during the next five years, especially along Maine's southern coast. The state of Maine has only 78 miles of sandy beaches so coastal development in Maine has already had serious impacts on the state's coastal resources. By 1977, sixty-two percent of the state's 1,900 acres of sand dunes had been developed and between 1954 and 1964 an astonishing 1,000 acres of coastal marshlands were filled. Clearly further coastal development needs to be discouraged. We strongly support the inclusion of 23 new units from this state into the System and the expansion of units A08 and A09.

Massachusetts

We commend the Department on the extensiveness of its 1985 inventory listing of potential units in the State of Massachusetts and support the inclusion of all of these areas within the System.

Rhode Island

D-01
We strongly oppose the deletion of any part of the D-01 unit in Sakonnet Harbor as requested by the Little Compton Town Council.

D09 Block Island
The natural resources of this unit are the basis for the Block Island tourist industry which is the town of New Shoreham's greatest economic asset. Moreover, New Shoreham and the Block Island Trust both strongly endorse the Department's proposed addition to D09.

I-05 Eastons Beach
Although listed in the 1985 inventory, through an error Eastons Beach was not recommended for inclusion in the 1987 draft report. This unit is not protected by the city of Newport or the State, as previously was thought by the Department, and should be included within the System.

We concur with the State Planning Council's recommendation to add McCurry's Point in Portsmouth to the System.

Connecticut

We support the proposed additions and expansions of all eligible units listed in the Department's 1985 inventory for Connecticut, including the sixteen areas requested for inclusion by the State of Connecticut.

New York

We endorse the Department's proposal to include areas along the Long Island Sound within the System. In addition to the importance of protecting the few undeveloped coastal areas left in this highly developed region, the serious problems of groundwater contamination and lack of solid waste disposal sites on Long Island make discouragement of further development and population growth critical.

NY-24 Plum Island
The beachspit and outcrop rocks at Orient Point should also be added to this unit.

NY-26 Pipes Cove
This unit should be expanded to include the area to Moore's woods.

New Jersey

We applaud the Department's decision to recommend the inclusion of New Jersey's undeveloped coastal barriers. As the most densely populated state in the nation, much of New Jersey's coastal resources have been seriously degraded. As a result, protection of the remaining undeveloped areas is of paramount importance.

NJ-02 Seidler Beach
Seidler Beach should be protected within the System because of its value as coastal bird habitat.

NJ-03 Cliffwood Beach
This unit should also receive CBRS designation due to its importance as coastal bird habitat.

NJ-04 Conaskonk Point
Protection of this area is especially important due to its important Spartina marsh vegetation, year-round diversity of wildlife, and valuable location as a resting place for migrating birds, including short-eared owls. Moreover, this area is under intense development pressure.

NJ-07 Ocean City Beach
The boundary of this unit should extend further back into the marsh and should also include the land between Logport Boulevard and Scull Bay as well.

NJ-09 Stone Harbor
It is important to include this area within the System because its valuable barrier spit contains remnants of a dune system and is valuable shorebird and colonial bird nesting habitat.

Delaware

We concur with the Department's expansion of the System to secondary barriers along the Delaware Bay. These areas are important in protecting the Delaware mainland from storm, erosion, and high sea level damage, as well as providing crucial fish and wildlife habitat.

Maryland

We are very pleased that the Department is recommending the inclusion of 6,287 acres of Maryland's coast. The Chesapeake Bay is one the Atlantic coasts greatest treasures, yet the pollution and habitat destruction from overdevelopment along the bay has seriously threatened the future of her once rich and abundant natural resources, including Maryland's valuable blue crab, clam and oyster industries. Inclusion of the undeveloped areas along the bay will discourage development, thereby helping to restore the Chesapeake Bay to its former glory. In addition to the Department's recommendations, other areas that we feel deserve CBRS designation are:

1. Mills Island located in Chincoteqague Bay. This area is too vulnerable to flooding to make it a sound prospect for development.

2. The many state protected lands along Maryland's eastern shore, especially in Somerset County.

3. The back bays of Maryland's Atlantic barrier islands, Isle of Wight, Assawoman Bay, Sinepuxent Bay, and Chincoteague Bay. These areas are very vulnerable to erosion and flooding and consist primarily of floodplains unsuitable for development, yet they are all under tremendous development pressure.

4. Rich Neck--the area north of the development (also known as Tilghman Point). This Point can be reached only by a very narrow strip of land and is also too unstable for development.

MD-01 Assateague--This unit is suffering from intense erosion problems. Proposals to spend millions of dollars on beach renourishment will serve only to increase erosion and lead to future costly expenditures for even larger beach renourishment projects. The federal government should not be subsidizing projects such projects as this, especially when the primary beneficiaries are mainland floodplain developers. Another example of wasteful federal expenditure in this "otherwise protected" area is the $80,000 reconstruction of the road along the dunes which lasted only three months before it washed out again.

Virginia

Much of the development occurring along the Virginia shoreline is the construction of second homes. The pollution resulting from this development--overflowing septic tanks, gas and oil leaks from heavy motorboat traffic--as well as direct destruction of wetland habitat is causing the decline of local fish and wildlife populations, including the commercially important oyster.

K-01 Assawoman Island
Although this island is less than a mile in width, it protects an area of wetlands over twice its size.

K-03 Cedar Island
This unit is currently experiencing intense development pressure, primarily to build second luxury homes for wealthy landowners. Erosion, however, has forced the relocation of the only significant structure yet completed in the unit.

In addition to the Department's recommendations for expansion of the System in Virginia, we propose the addition of the following areas:

1. Morris Island--This area is subject to much flooding, making it an unstable area for development. Lack of infrastructure has thus far prevented development in this area.

South Carolina

We approve of the additions to the System proposed in South Carolina and urge the Department to maintain these proposals in its final recommendations to Congress.

North Carolina

As with South Carolina, we are very pleased with the Department's recommendations for additions to the System within North Carolina. North Carolina has some of the most beautiful and popular shoreline on the East Coast. Unfortunately, its coast is also experiencing the unabating problems of sea level rise and erosion--a prime example of this being the two houses on Nags Head which recently collapsed into the sea--making maximum expansion of the System in this state very important.

L-09 Masonboro Island
In addition to the Department's recommended additions, we request the inclusion of the entire area of the Masonboro Island complex proposed for inclusion within the North Carolina National Research Reserve System, including the area between the barrier island and the Intracoastal Waterway. Masonboro Island is the largest undisturbed barrier island along North Carolina's southern coast and serves as as invaluable research site for the University of North Carolina. In addition, this island provides important nesting habitat for tern and shorebird colonies, as well as the

threatened loggerhead sea turtle.

Georgia

N-014 Wassaw Island
Unit N-014 should be expanded to include Green Island, Petit Gauke Hammock Island, Rose Dhu Island and adjacent wetlands.

Florida

We commend the Department on its far-reaching recommendations to protect much of Florida's coastline within the CBRS, and reiterate our strong support for the inclusion of the fragile Florida Keys. Florida has a 9.7% annual chance of receiving a hurricane and it would only take a single great hurricane to wreak severe destruction in many of Florids's coastal cities. Moreover, residents on the Keys are particlularly vulnerable to hurricanes due to the limited exit routes off the islands during a storm, so any increase in population due to development would consequently jeopardize the lives of those people already living there. Further development of this area should also be discouraged because of the limited supply of fresh water, landfill sites, and other necessary accoutrements to development. In addition to the areas recommended for includion into the System by the Department, we also request the addition of several more areas mentioned below in the following comments.

P-02 Talbot Island Complex
We are very pleased with the additions to this unit. P-02 includes a thriving marsh system which is vital to local fisheries. Fort George Island especially is a unique barrier island which has several rare plant species, some of which are found nowhere else. Additional areas within this region which we feel should be included in P-02 are around Great Marsh Island and Chicopit Bay west of the naval base which is a good spot for flounder.
We also feel that the entire Black Hammond Island should be included within the System, especially the extensive pristine wetlands on its western side. Portions of Black Hammond are only four miles from the inlet at Mayport and three miles from the Ft. George Inlet so it qualifies for inclusion. Furthermore, the current Department recommendations already include some of the Island's associated wetlands. The island's current exclusion is based upon an arbitrary distance, not its natural attributes (flood probability, wetlands, wildlife) or the level of development. Black Hammond Island is the longest stretch of privately-owned, undeveloped coastline in Florida and is a low lying, high hazard area during hurricanes. Phase II and III of the Hammonds Dune development project haves not received permits yet, but along with Phase I would put 12,000 people on the island over the next 20 years. CBRS designation is needed to discourage such unsound and damaging development.

P-04A Usinas Beach
We are also very pleased with the addition of important wetlands to this unit because they protect functioning wetlands near the St. Augustine Inlet. We suggest that additional wetlands--Sombrero

Creek, Ximanies Creek, and the Intracoastal Waterway--linking the Guano River Tract and Tolomato River (two state protected areas north of P04A) also be included in this unit.

P-05A Matanzas River

We support the inclusion of Pellicer Creek as this area is an aquatic preserve and warrants CBRS protection. Additional areas that we feel should be included in this unit are the Pellicer Flats to the south and the extensive marsh sytem which extends north up to Devil's Elbow. The latter area is vital as a redfish, seatrout, and flounder nursery. These low-lying areas are also flood prone due to their proximity to Matanzas Inlet. We feel that Matanzas Inlet should also be included within the System. It is the last natural inlet on Florida's eastern coast, provides nesting habitat for the threatened least tern, and is a popular fishing and birdwatching spot with local residents. The inlet also supports populations of sea turtles, manatess, and numerous bird species. Matanzas Inlet should not be eligible to receive federal funds for construction of such permanent structures as jetties which would disrupt the natural flow of sand along the coast. In addition, there is a quarter mile of undeveloped beach front between Marineland and Washington Oaks State Park which qualifies for inclusion within the System extending to the Intracoastal Waterway.

P-05 Conch Island

Although limited development has already occurred on Porpoise Point, the instability of this sandbar makes it unsuitable for further development and federal funds for this purpose should be prohibited. We support the continued inclusion of Porpoise Point in P05.

P-07 Ormond-by-the-Sea

While we support the recommended additions to P07, we were disappointed that the Department neglected to include any of the important wetlands and coastal areas in the heart of Flagler County. To the south of P07 there is approximtely 1/2 mile of undeveloped, privately-owned beachfront that should be included. P07 should also be expanded to include all of Bulow Creek. The northern edge of P07 stops arbitrarily at the Flagler County line but between the county line and Flagler Beach Recreation Areas are thriving wetlands which are contiguous with the Bulow/Tomoka marsh system. This area marks the northern boundary for snook and contains excellent fishing, including trout, redfish, bluegill, flounder, snook, and drum. These wetlands also provide feeding grounds for osprey, eagles, hawks, and shore birds. Porpoise and endangered manatees are also seen.

P07 should be expanded to link with Tomoka basin to the south (which is state protected) extending to Flagler Beach State Park to the north. To the south of this unit is approximately a half mile of undeveloped, privately-owned beachfront and to the north between the county line and State Road 100 there are two small secondary barrier islands along the Intracoastal Waterway which should be included. In addition, there are extensive wetlands to the north of Flagler Beach State Recreation Area which also should be included.

P-08 Ponce Inlet

We support the additions to P08, but the boundary should be extended northward to the Pt. Orange Causeway and westward into Turnbull and Rose Bays. These areas include mangroves, marsh grasses, pelican roosts, and good fishing areas. Rose Bay is also an excellent spot for snook and large sea trout. Moreover, this area is experiencing severe development pressure, including a multi-million dollar public marina in the heart of the wetlands north of New Smyrna Beach which will open up the area for more development and damage the shallow inter-island water area with increased boating activity.

P-09A Coconut Point

P09A contains valuable mangroves and wildlife habitat near the Sebastian Inlet which provides an excellent fishing area. This region, however, is under heavy development pressure and thus is in need of protection within the System.

P-10 Vero Beach

The additions to P10 are very important because this region of the Indian River is a prime recreational and commercial fishing area and contains valuable shrimp habitat. This area also boasts vital mangrove and wetland habitats which support important nesting colonies and winter populations of herons, egrets, wood storks, black skimmers, comorants, terns and pelicans to name just a few. Moreover, much of P10 is a very low-lying area vulnerable to flooding and storm damage.

This area was originally considered for CBRS designation in 1982, but strong political pressure prevented its inclusion by Congress even though it met the CBRS criteria. Although most of this area was planted in orange grove plantations, much of it has now been put up for sale or has been sold for development, making CBRS designation essential to discourage unsound and damaging development. We recognize that orange groves are far less damaging to coastal ecosystems than resort development, especially if proper pesticide use is maintained. We support including this area and making a special exception in the Act for agricultural subsidies.

FL-71 Gasparilla Sound

We request the addition of the publically-owned western half of Gasparilla Sound which is an aquatic preserve. Aquatic preserves in Florida do not provide adequate constraints on activities to qualify as "otherwise protected."

P-11 Hutchinson Island

We endorse the proposed additions to P11.

1. Pine Island--We request that the Department examine the possibility of including Pine Island within the System. It is a large coastal island in southwestern Florida protected by the Cayo Costa barrrier and consisting primarily of privately-owned, undeveloped, low-lying areas surrrounded by unprotected wetlands habitat.

2. Boot Key--We also believe that Boot Key should be included within the System because it is an actual barrier island within the Keys system and provides protection for both Marathon Key and Boot Key Harbor. Most of the Key consists of low lying wetlands and red mangrove vegetation and has important value as wildlife habitat. There is no development on Boot Key currently but there are prospective plans for it. Since Boot Key is not adequately protected by local ordinances, it needs the protection of CBRS status to preserve its valuable coastal resources.

Alabama

Alabama has only a limited coastline, but it is in the direct pathway of hurricanes and other tropical storms. Consequently, it is important to protect what little shoreline and coastal resources Alabama does have from damaging development. We support the Department's recommended additions to the System in this state.

Q-01 Mobile Point

Fort Morgan Peninsula should receive continued designation in CBRS. This twin strip of land possesses significant floral and faunal assets. It also serves as a migratory pathway for many trans-Gulf migrant birds, including the endangered peregrine falcon. Development in this unit occurred after the 1982 designations so deletion is unwarranted. If development of a unit insures its deletion from the System, then there is no incentive to leave fragile coastal lands undeveloped, and the act serves little purpose. We are adamantly opposed to the deletion of this unit from the System.

We also recommend the inclusion of Perdido Pass at the mouth of the Perdido River in Baldwin County and the undeveloped portions of Dauphin Island in Mobile County.

Mississippi

MS-01 Gulf Islands

"Sands Island", a small dredge-spoil island in Horn Island Pass, should be included. The island is being stabilized by pioneering dune vegetation and is now a major nesting and resting location for gulls, terns, and other migratory shorebirds.

MS-04 Heron Bay Point

MS-04 should be expanded to include all marshes south of Three Oaks and Heron Bay bayous.

R-03 Cat Island

We are pleased the Department has decided to recommend the inclusion of all of Cat Island within the System. Cat Island is a unique barrier island because it is a combination of two islands, one moving and one stationery, and now is in the form of a T-shaped island.

Texas

Texas has some of the most valuable coastal resources of any state on the Atlantic and Gulf coasts. With over 375 bird species visiting her coast annually, Texas is a critical stopping ground for birds migrating along the Central and Mississippi Flyways, including many songbirds and such endangered species as the whooping crane, bald eagle, brown pelican, and peregrine falcon. In addition, Texas wetlands provide essential wintering habitat for over a million waterfowl and prime nursery grounds for many commercially and recreationally important fish and shellfish species. This rich array of nationally important coastal resources combined with Texas' high probability of hurricanes--over a 13% chance of a hurricane occurring somewhere on the Texas coast each year--makes coastal protection under CBRA a necessity. We urge the Department to stand firm behind its current recommendations for additions of Texas acreage into the CBRS and oppose any deletions of existing acreage from the System.

TX-17 Mustang Island

The bayside of Mustang Island is an important spawning, nursery, and nesting habitat for numerous commercially and recreationally important fish and wildlife species. In addition, its vulnerability to flooding makes it an unwise site for development. This unit was originally considered for inclusion in the 1982 CBRS designations but was dropped due to political pressure. We urge the Department to reconsider and include Mustang Island in its final recommendations. We also request the addition of the area known as the "cave" in this unit because it is a very productive wetlands area.

T-12 Boca Chica

We strongly support the Department's proposed addition of 13,280 acres to this unit. South Bay contains the only oyster beds south of Corpus Christi uncontaminated enough to harvest and the only ones on the entire Texas coast which can be harvested year-round. The broad expanses of wetlands in the Boca Chica area are extremely high in wildlife diversity, including over 90 species of fish. These wetlands are also critical to birds migrating along the Central and Mississippi Flyways and many wintering waterfowl and shore birds, as well as the endangered brown pelican and peregrine falcon. Unfortunately, this productive coastal ecosystem is slated for a major resort development, Playa del Rio, which will generate an estimated population of 15,000 people in the area. This development would destroy some 5800 acres of wetlands--the largest loss of wetlands to residential development anywhere in the United States. It will also exacerbate the water shortages already being experienced in the area, threaten Boca Chica's abundant wildlife populations through habitat loss and pollution, and endanger the lives and property of the thousands of people who settle in this hurricane-prone region. We urge the Department to stand firm in its decision to recommend the inclusion of additional area to T-12.

In addition to these units, the seven miles north from the city limits of the Town of South Padre Island to the end of Park Road 100

meet the criteria for inclusion within the System and should be added.

Louisiana

The State of Lousiana is suffering from severe coastal land loss--up to 40 square miles each year. Most of Lousiana's coastal barriers are low lying landforms which are subject to high erosion and flooding and are unsuitable for development. Along with the State, we support the Department's inventory of unit additions to the System in Lousiana.

The Virgin Islands

We strongly support the inclusion of the Virgin Islands within the CBRS. This territory has highly productive coastal ecosystems of mangroves, seagrass beds, and coral reefs which serve as important feeding and breeding grounds for a diversity of wildlife, including commercially valuable fish and shellfish species. The development demands from a growing population and tourist industry makes protection of these fragile areas within the System essential. In addition to the areas recommended by the Department, we propose the following additions:

1. The many coastal mangrove strips along impounded bays and ponds which qualify for inclusion under the Department's proposed expanded definition of a "coastal barrier" because of the significant protection they provide the mainland. A good example of this is the Manning Bay along the southern shore of St. Croix.

2. Salt River bay along the northern shore of St. Croix. This area contains an offshore barrier reef which protects the bay from damaging waves and storms and one of the finest examples of zonation between white, red, and black mangroves in North America and the Caribbean.

Puerto Rico

As with the Virgin Islands, we are very pleased with the proposed protection of Puerto Rico's rich coastal resources within the System and support the inclusion of all 10, 102 acres into the CBRS.

The Pacific Coast

Although the Department of Interior included well over 150,000 acres of undeveloped barriers along the Pacific coast in its 1985 inventory, it neglected to include any of these areas in its 1987 draft report. Most of the Pacific's coastal barriers occur at the mouths of rivers where alluvial deposits have created rich, fertile areas which are vital to numerous species of fish and wildlife. These areas provide critical spawning grounds for salmon and sea-run trout, important resting places for migrating birds, and essential habitat for commercially and recreationally valuable fish and shellfish. We feel that the Department's decision should be

reversed and urge the Department to recommend the inclusion of appropriate areas along the Pacific coast within the System. Included below are specific comments on some of these areas.

California

CA-02 Talawa
This unit contains a valuable "living" sand lure and Lake Earl and Talawa support a large population of migratory and wintering waterfowl, particularly canvasbacks. Sewage pollution from an adjacent subdivision is currently threatening the area.

CA-04 False Klamath River
The Klamath River is one of California's major anadromous fisheries and supports one of the longest runs in the state.

CA-08 Dry Lagoon
We request that the continuous dune barrier to the Redwood Creek estuary which stretches from Big Lagoon to Dry Lagoon to Stone Lagoon be added to this unit.

CA-09 Little River
Like many north coast streams, the mouth of the Little River shifts frequently and often rapidly, anywhere between the Mad River and Pilot Point (the northern cliff face and backdrop to Moonstone Peach). We recommend the extension of CA-09 to the maritime landmark Pilot Point due to the shifting nature of the stream.

CA-12 Widow Whites Creek
Units CA-10, CA-11 and CA-12 undergo dramatic changes in extremely short periods of time. The Mad River mouth has been moving northward over the past twenty years, resulting in the creation of a long sand spit. The entire coastal dunes system from Mad River County Park to Clam Beach County park should be included within the System.

CA-13 Samoa Peninsula
The North Spit is an important coastal area which is being threatened by off-road vehicle use.

CA-16 Mattole Beach
The entire area from Mattole Point to Christmas Rock, including a sandy beach and other aquatic habitat, also should be included within CA-16 because it is an inseparable part of the Mattole coastal barrier ecosystem and critical to the protection of the fish, birds, and other wildlife and natural resources of this area. The expanded CA-16 area has been recommended for decades by conservationists for designation as a protected natural area due to its outstanding natural features.

CA-17 Manchester Beach
The Alder Creek mouth includes a full barrier sand spit most of the year and well-developed estuarine habitat to the Highway One bridge. A brackish estuarine pond exists behind the barrier most of the year and extensive sand beach/dune habitat lies south of Alder Creek to the mouth of the Garcia Rivr. Salmon runs are excellent

when the barrier is open. The sand beach, grassy dune areas and other aquatic habitats are inseparable parts of the whole Alder Creek to Garcia River coastal barrier ecosystem and are essential to the preservation of its wildlife resources.

CA-18 Gualala Point
When breached in the rainy season, this coastal barrier sandspit provides anadromous fish passage into the Gualala River habitat system. The small islands located in the estuary should also be included within CA-18.

CA-20 Bodega Harbor
The extensive tidal flats within the harbor support a large invertebrate population and consequently an important feeding ground for numerous waterfowl and shorebirds.

CA-24 Limantour Spit
This unit is frequented by numerous shore birds, migratory waterfowl, and several species of marine mammals.

CA-27 Rodeo Cove
Over 150 species of bird have been observed on or near the lagoon, including numerous waterfowl. The freshwater marsh also supports a wide variety of wildlife.

CA-33 Moss Landing
We recommend the expansion of CA-33 to connect it with CA-34 in order to protect all of the barrier island dunes created by the Old Salinas River Channel.

CA-34 Salinas River
Approximately 27 miles of dunes on the shores of Monterey Bay constitute a coastal barrier ecosytem. We recommend the addition of the aquatic habitat and vernal ponds of the Moss-Landing Marina as an essential component of this ecosystem.

CA-35 Seaside
We recommend the addition of Carmel River, San Jose Creek, Little Sur River, and Big Sur River to CA-35.

CA-36 San Simeon
This unit protects a significant stream/ocean lagoon with a rich diversity of wildlife, including anadramous fish runs.

CA-37 Morro Bay
CA-37 represents the greatest estuary on the Pacific coast between Monterey County and Orange County and provides important fish spawning habitat. Morro bay is a major stop on the Pacific flyway and is utilized by some 75 species of water and shore birds, including several endangered species.

CA-38 Santa Maria
This unit consists of undeveloped beach protecting the mouth of the Santa Maria River and its associated wetlands.

CA-40 Goleta Beach
This is one of the best examples of a rapidly developing and evolving salt marsh in California.

CA-47 Bolsa Chica
The Bolsa Chica lowlands are an important link to a once-expansive area of wetlands in Orange County. The wetlands that exist at the site lie below sea level and are subject to considerable influence from tidal groundwater. Two endangered birds breed here--the light-footed clapper rail and the Beldings Savannah sparrow.

CA-48 Huntington Beach
CA-48 is an important active wetlands area even during its complete isolation from the ocean in the summer months.

CA-49 Pendleton
CA-49 is a prime nesting habitat for the California least tern and is proposed as critical habitat for the least bell's vireo.

CA-52 Batiquitos
The endangered California least tern breeds here and post breeding flocks concentrate in this area before their fall migration.

CA-53 San Elijo
At least 50 species of water birds have been identified in this area, including three endangered species which breed here.

CA-56 Imperial Beach South
CA-56 includes the Tijuana Estuary which is southern California's largest and most ecologically diverse tidally-flushing estuary complex.

Hawaii

Hawaii is a state with many unique and valuable natural resources--coral reefs, wetlands, and beaches--which are threatened by intense development pressure. In addition, over 90% of the plant and bird species in Hawaii are endemic to that area and whose futures will jeopardized by habitat destruction if development is not adequately controlled. We urge the inclusion of all units in the 1985 inventory, as well as some additional areas listed below.

HI-05 Kalapana
This unit includes a fish pond formed by a barrier beach creating a single, elongated sand ridge that paralleled the shoreline--it is not manmade.

HI-12 Kanaha Pond
Inland of the beach is the State of Hawaii Kanaha Pond Wildlife Refuge, an important wetland habitat for the endangered Hawaiian Coot and Hawaiian Stilt.

HI-13 Kealia
Inland of the beach is Kealia Pond, an important palustrine type wetland for endemic endangerd water birds and migratory waterfowl.

HI-22 Wainiha Bay
This unit is of great scenic, natural, and cultural value and is especially important as habitat for migratory birds.

HI-24 Hanalei
The Waipa and Lumahia Valleys, which lay betwen Hanglei and Wainiha, should also be included as they are wetland marsh areas which provide important nesting and feeding habitat for a variety of waterbirds.

Oregon

Relative to many other states, Oregon's estuarine and bay resources are not overally rich or abundant. The small, scattered coastal habitats Oregon does have, however, support vital feeding and resting areas for thousands of migratory birds, and provide the base of the food chain for important commercial and recreational fisheries. In addition, Oregon's coastal areas provide essential habitat for many federally threatened and endangered species, including the bald eagle, peregrine falcon, Aleutian Canada Goose, brown pelicans, and snowy plover. As a result, protection of these areas is made even more critical.

We strongly endorse the inclusion of all the potential units in Oregon included in the 1985 inventory. In addition, we request the inclusion of the following new areas.

1. Sears Lake coastal barrier (.3 miles) located approximtely 1.5 miles north of Cape Kiwanda in Tillamook County.

2. Siletz Bay Coastal Barrier (.5 miles) in Lincoln County. The undeveloped northern portion of the Siletz Spit on Siletz Bay represents a major Oregon coastal barrier not included in the 1985 inventory.

3. Big Creek coastal barrier (1.1 miles) located along Roosevelt Beach, south of the Lincoln-Lane County line.

4. and 5. Sutton Creek (1.1 miles) and Siltcoos River (1.25 miles) coastal barriers recommended for inclusion to the Oregon Department of Land Conservation and Development (DLCD) by Lane County.

6. Tenmile Creek coastal barrier (1.4 miles) a State-designated "natural estuary" located in the south end of the Oregon Dunes National Recreation Area.

7. Winchuck River coastal barrier (.25 miles) on the southernmost river on the Oregon coast. This river has been given "conservation" status in Oregon's coastal plans.

We also request the following additions and expansions to the potential CBRS units listed in the Department's 1985 inventory:

OR-05 Seaside Inlet
Add salt marsh area immediately north of Neawanna Creek confluence with the bay.

OR-07 Nehalem Spit
Add Dean Bay to the east side of the Nehalem River.

OR-08 Kincheloe Point--Add:
a. Smith Lake--extend boundary one mile north to Tillamook Bay to the southern end of the Watesco development and include Barview County Park and associated wetlands.
b. Miami Cove--northeast end of Tillamook Bay.
c. Southern end of Tillamook Bay.

OR-10 Sand Lake
Expand the barrier to include the entire north spit.

OR-11 North Spit
Include the southeast end of the bay (these bay portions were also recommended for inclusion in 1985 by James Ross, Director of DLCD).

OR-13 Salmon River Spit
Add upper portion of river and tidal areas.

OR-18 Siuslaw Spit
Extend the barrier approximtely .4 miles north to include North Jetty Lake just above North Jetty Road.

OR-20 Tahkenitch Lake
Extend the boundary east to Tahkenitch Lake and approximtely .4 miles north to include the entire Tahkenitch Creek north spit.

OR-22 Winchester Bay
Expand the wetland designation to the west shore of Bolon Island, including all of Steamboat and Cannery Islands.

OR-24 North Beach
Expand the barrier spit approximtely 4.75 miles north to include Snag, Teal, Sandpoint, Bluebill, Horsefall and Spirit Lakes. Expand the wetland designation inland to just west of the Highway 101 bridge to include Jordan Cove, Pony Slough, North Slough, and Haynes Inlet.

OR-27 Fourmile Dunes
Expand the boundary inward to include Laurel Lake. Also, this barrier is really contiguous with R-28 which has extended (by natural forces) approximately a mile north and now enters the ocean opposite the south end of Laurel Lake.

Washington

WA-70 Cranberry Creek and WA-71 Sampson
This unit deserves CBRS status as it includes several types of wetland, providing excellent habitat for various wildlife, especially many species of migrating birds and wintering waterfowl

and shore birds. In addition, the northern boundary of WA-70 should be moved north to include all of Conner Creek, Ocean City Beach should also be included, and the southern boundary should extend to the WA-71 so the two units are connected. The boundaries of WA-71 should be expanded on all sides to include the unique swamps surrounding the unit.

WA-72 Point Brown

This unit should be included due to its extremely unstable shoreline and the magnitude of erosion and deposition it is currently experiencing which makes it unsuitable for development. Moreover, this area has one of the richest aggregations of birds in Washington State, including 24 species of shore birds, snowy owls, and peregrine falcons. It also includes the northernmost nesting site of the snowy plover which is suffering from a serious population decline throughout its range.

WA-73 Grays Harbor

This unit is of scientific interest as gulls and terns have colonized the artificially constructed Sand and Goose Islands.

WA-74 Port Chenalis

The boundaries of WA-74 should be extended both north and south to the east of Highway 105 to include the unit's associated wetlands.

WA-76 Grayland

Since much of this sensitive coastline in this area is already developed, inclusion of WA-76 is even more important.

WA-78 North Beach Peninsula

This area contains critical snowy plover nesting habitat and should remain in an undisturbed condition.

In addition to including the areas identified in the Department's 1985 inventory of potentially eligible units, we also strongly recommend the inclusion of the following areas along the Washington coast:

1. North Beach Penninsula in Willapa Bay and the Bay itself.

2. Port Chehalis area on both the ocean and bayside of Westport.

3. Point Brown and Damon Point south of Ocean Shores--this site is habitat and nesting area of the snowy plover.

4. Areas on the north shore of the Olympic Peninsula such as the Dugeness spit and other areas down to Deception Pass.

5. The north head of Chuchanut Bay on the quadrangle east of Lumni Island.

6. The bay northeast of the North Head lighthouse on the Cape Disappointment quadrangle.

7. Ediz Hook, a sand spit in the Strait of San Juan de Fuca which curves above the city of Port Angeles--this unit is especially

vulnerable since its sand source was cut off by the Elwha Dam.

The Great Lakes Coast

A total of 88 unprotected and undeveloped areas along the Great Lakes shoreline were listed in the Department's 1985 inventory, but, as with the Pacific coast, the Department chose not to recommend the inclusion of this coast in the System. We believe the Department erred in this decision. In light of the current problems the Great Lakes state are experiencing with high water levels, inclusion within the System is both timely and appropriate. We urge the Department to reconsider its decision and recommend expansion of the System to include the eligible areas along the Great Lakes coast.

997

THE WILDERNESS SOCIETY

FOUNDED IN 1935

June 16, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service-498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Study Group:

The April 1985 initial draft issued by your group recommended that the 181 units in the Pacific Coast Inventory be included for protection under the Coastal Barrier Resources Act (CBRA). I now understand that your group is recommending that all 181 units in the Pacific Coast Inventory be excluded from protection under the CBRA. I strongly urge you to reverse this recommendation, and restore particularly the 75 units in Washington (61 miles of shoreline) and 23 units in Oregon (42 miles of shoreline).

Coastal barriers in the Pacific Northwest support very diverse and productive ecosystems. In fact, many of the units in Washington and Oregon are located at the mouths of rich, fertile rivers that provide spawning grounds for salmon and sea-run trout. Commercial salt water fish and shellfish thrive in these areas, and the coastal wetlands are an essential link in bird migrations. The habitats hang in a balance sustained by natural barriers that have evolved over centuries. Many coastal communties are economically tied to the ocean animals dependent on habitat provided by coastal barriers.

Developments in coastal barrier areas can (and often do) result in coastal ecosystems more vulnerable to destructive natural forces. This often results in rapid, and often irreversible, habitat loss.

I urge you to recommend to Congress that all 181 units in the Pacific Coast Inventory be protected by the Coastal Barrier Resources Act.

Sincerely,

Jean C. Durning

Jean C. Durning
Regional Director

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Wildlife Management Institute

Suite 725, 1101 14th Street, N.W., Washington, D.C. 20005 • 202/371-1808

June 19, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
Post Office Box 37127
Washington, D.C. 20013-7127

Dear Sir:

We have reviewed the "Draft Report to Congress: Coastal Barrier Resources System." We would like to offer the following comments on recommendations proposed by the Interior Department regarding the Coastal Barrier Resources Act (CBRA) and the Coastal Barrier Resources System (CBRS).

The Wildlife Management Institute strongly supports the following Department of the Interior recommendations:

1. Addition of undeveloped, unprotected coastal barriers of the Florida Keys, Puerto Rico, and the Virgin Islands to the CBRS;

2. Addition of all aquatic habitats associated with existing and future CBRS units including: all wetlands (e.g., tidal flats, swamps, mangroves, and marshes); inlets; lagoons; estuaries; coves between the barrier and mainland; 1 mile expanses of open, nearshore waters seaward from the coastal barrier which contain the sand-sharing systems affecting the barrier; and, in units located in tropical regions, the coral reefs associated with nearshore mangroves;

3. Addition of secondary barriers (e.g., Narragansett Bay, Chesapeake Bay) to the CBRS;

4. Inclusion of all privately owned property within a conservation or recreation area established by federal, state, or local law on an undeveloped coastal barrier in the CBRS in an effort to alleviate the incentive to subdivide or sell off the private parcells for development purposes;

5. Inclusion of appropriate excess/surplus Federal properties in the CBRS prior to their disposal, unless they otherwise qualify for exemption under the law;

6. Restriction of Federal funding for facilities located outside a CBRS unit whose direct purpose is to provide tangible products within the CBRS unit (e.g., water, electricity, etc.);

7. Deletion of Section 6(a)(3) which would allow the maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly-owned or publicly-operated roads, structures, or facilities authorized under Section 6(a)(6)(f) provided that they are consistent with the purposes of CBRA;

8. Amendment of Section 6(a)(2) so that it would read: "the maintenance of existing channel improvements and related structures, such as jetties, and including the disposal of dredged materials related to such improvements, which shall be performed in a manner consistent with the purposes of this Act."; and,

9. Undertaking of a joint study conducted by DOI, DOD, FEMA, and NOAA to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers following major storms or hurricanes.

WMI opposes the following recommendations:

1. Exemption from CBRA restrictions of any previous CBRS lands acquired by a conservation/recreation unit managed by a government agency, or the deletion of any CBRS lands on military and Coast Guard lands;

2. Proposal for no regulatory amendment to the CBRA requiring evaluations of federal permits on or adjacent to coastal barriers in the CBRS to ensure that they are consistent and compatable with the conservation and safety goals of CBRA.

To ensure conservation of fish and wildlife resources on and around barrier islands, the Wildlife Management Institute recommends that:

1. Necessary studies be made for the inclusion of undeveloped coastal barriers along the Pacific Coast, Great Lakes, Alaska, Hawaii, and America Samoa in the CBRS;

2. Further protection be given to all areas in the CBRS held under federal, state, or local laws, as well as those held by the private sector, to ensure that projects and/or activities on these properties are consistent with the CBRA and do not adversely impact fragile portions of the ecosystems (e.g., primary sand dunes) within their boundaries;

3. Federal funding be denied for projects or activities on lands within or adjacent to the CBRS which are inconsistent with the goals of the CBRA and potentially may have substantial negative impacts on a CBRS unit including such activities as channel maintenance, road maintenance, military activities or all other potentially valid exceptions to CBRA limitations discussed in Volume 1 of this report; and,

4. Additional efforts in public education should be made to help coastal residents and government officials understand these complex ecosystems and make more informed decisions.

Sincerely,

Laurence R. Jahn
President

LRJ:dt

1268

National Audubon Society

National Capital Office 801 Pennsylvania Ave. S.E. Washington, D.C. 20003 (202) 547-9009

June 23, 1987

The Coastal Barriers Study Group
Department of the Interior
National Park Service
P.O. Box 37127
Washington, DC 20013-7127

To Whom It May Concern:

I write today on behalf of the National Audubon Society to comment on your proposed amendments to the Coastal Barriers Resources System (CBRS), which was established under the Coastal Barriers Resources Act (CBRA) of 1982 (Public Law 97-348). Since its very inception nearly one hundred years ago, the Audubon Society has maintained a deep concern with the preservation of habitats. Especially crucial to this concern has been the Society's involvement in issues affecting important coastal estuarine habitats. Having been intimately involved in the passage of CBRA in 1982, we welcome this opportunity to express our views on these proposed amendments.

In general, we are in favor of the many proposals made by the Study Group which would expand and strengthen the existing CBRS. We applaud measures which would add new areas to the CBRS, expand the definition of "coastal barrier," and tighten federal funding guidelines for projects affecting areas within the System. However, there are several proposals which we cannot support. These proposals include ones which would exclude coastal barriers along the Pacific Ocean and Great Lakes from the CBRS, weaken the Department of Interior's ability to implement CBRA effectively, eliminate any formal processes through which to monitor federal compliance with CBRA, and require no regulatory consistency with CBRA on behalf of federal permit programs.

Proposals Which We Support

Many of the recommendations made by the Coastal Barriers Study Group would strengthen the Coastal Barriers Resource System, and, therefore, are supported by us.

Inclusions of areas of Texas, Florida, Maryland, New Jersey, Puerto Rico, and the Virgin Islands are all positive steps. These coastal areas serve vital functions, supporting rich, diverse habitats while providing economic benefit and protection to the mainland. Yet all of these areas have come under increasingly intense pressure to develop, and have already suffered from an array of human activities. Further expansion into these areas must be

discouraged. Development pressure is especially acute in Bolivar Peninsula and Boca Chica in Texas, and in Vero Beach and the Keys in Florida. In Texas, for example, with pressure on state agencies to produce revenues, the state is offering to lease much of its coastal lands to developers. These developers would have great incentives to take such lands, if they could obtain federal subsidies. The federal government, through subsidies, should not encourage such activity there, or in any other important coastal region.

Inclusion of "associated aquatic habitats" and secondary barriers within the Coastal Barrier Resource System (CBRS), as well as expansion of the term "coastal barrier," are also necessary, positive measures which recognize more clearly the need to include lands within the barrier system on the basis of function, not simply on the basis of location or composition. Coastal barriers involve much more than their landfast portions; barriers and their associated aquatic habitats are closely interdependent. These aquatic habitats protect barriers and are crucial for coastal fish and wildlife populations. Secondary barriers in large embayments are also wise inclusions within the system. Although the forces which form these barriers are not directly derived from the open ocean, they play the same roles as open ocean barriers; they support fish and wildlife and protect the mainland from storms and erosion. Expansion of the term "coastal barrier" to include those barriers not necessarily composed of unconsolidated sediments is also a prudent move. Many of these barriers serve the same vital fuctions as their unconsolidated counterparts, and, therefore, deserve to be included in the CBRS.

We also support the inclusion in the CBRS of private inholdings within "otherwise protected" conservation or recreation areas. Private individuals and groups, regardless of their present orientation, may be tempted to sell or subdivide their property in order to generate funds. By denying these areas federal support, a major incentive to development would be removed.

Recommendations which clarify and tighten federal funding guidelines and which mandate consistency with the Coastal Barriers Resource Act (CBRA) in constructing "improvements" are also prudent measures. Development within a sensitive coastal barrier would certainly be facilitated by projects which may not be entirely located within the barrier itself -- such as water or electrical lines. Such spurs to development should not be subsidized by the federal government. Similarly, the expansion of "essential links" to coastal barriers should not be encouraged. Other "improvements" -- like channel and jetty maintenance -- proposed for areas in or around coastal barriers should not be conducted by federal agencies in a manner that is detrimental to the coastal barrier. Requiring that such activities "be performed in a manner consistent with the purposes of" CBRA is, therefore, a proposal which we support.

Proposals Which We Oppose

There are, however, several aspects of the Study Group's recommendations with which we disagree.

1. Exclusion of Pacific Ocean and Great Lake Coastal Barriers

Coastal barriers along the Pacific Ocean and Great Lakes should not be excluded from CBRS. These barriers fit the definition of "coastal barriers" as used by the Department of Interior, and especially as expanded by the Study Group. Pacific and Great Lake barriers serve the same valuable functions as do those barriers already included in the system; they support aquatic and terrestrial populations and protect the mainland and wetlands from storms and erosion. With the inclusion of secondary barriers and barriers that are not formed from unconsolidated sediments, the Study Group has established the precedent that function should be the primary criterion for including barriers within the system; denying inclusion to these areas would be inconsistent with this precedent.

These barriers are also subjected to the same wave, tidal, and wind energies as are those barriers already included within the system. While at different times of the year and in different forms than those along the Atlantic, potentially destructive storms also strike the Pacific and Great Lake shores. During such times, these barriers once again prove their importance by sheltering mainlands from the brunt of storms' impacts. Pacific and Great Lake coastal barriers are also threatened by the same development pressures that jeopardize Atlantic barriers, and, therefore, warrant the same protection.

2. Proposals Which Weaken CBRA Effectiveness

There are several proposals which would seriously limit the effectiveness of CBRA. One recommendation would give the Secretary of the Interior the authority to allow certain activities (such as energy projects, channel maintenance and military activities) within CBRS units. While we hope that the Secretary would never sanction any harmful activities, the "blank check" offerred to the Secretary is a potentially dangerous one. Either such power should not be granted, or some limitations or checks upon the Secretary's power should be enacted.

Of the many proposed deletions from existing CBRS units, the one which we most vehemently oppose is the deletion from unit Q01 in Mobile Point, Alabama. The National Wildlife Federation claims that development of a 3,105 acre unit there by US Capitol Gulf Shores occured after the original October 1982 designation of the area within the CBRS. This allegation calls into question the Study Group's claim that the area was included in 1982 mistakenly because it had already been developed. To clear the way now for federal funds would certainly emasculate the Department of the Interior's capacity to implement CBRA. If all that one need do is to develop an area within CBRS to ensure its eventual exclusion, what purpose does the system serve in the first place?

Another proposal with which we cannot agree involves the exclusion of military lands from the system. We do not agree that all military activity is "essential to the National security." To encourage development within coastal barriers owned by the military by excluding them from CBRS, while discouraging activities in other areas ignores the tenor and intent of CBRA.

3. No Adequate Means of Verifying Compliance with CBRA

The Study Group proposes to eliminate the Office of Management and Budget (OMB) program of monitoring federal agencies' compliance with CBRA, to exclude from the Act any amendments which would mandate compliance with CBRA from federal permit programs, and to exclude "otherwise protected" areas from the CBRS. Such proposals were made with the intent of minimizing the beaurocratic complications and cost of running the CBRS. We feel, however, that these proposals leave the Department of Interior with no formal means of verifying federal compliance, and that they are made simply upon an assumption of future compliance with the Act on the part of all federal agencies.

Without some formal monitoring system, potential violations of CBRA have a far greater chance of going unnoticed. While we agree that the present OMB certification process is largely useless, we feel that there must be some formal means through which to monitor federal compliance with CBRA. Such a proposal must be enacted, if this Act is to have real, sustainable power in the future.

The proposal to include no amendments which would mandate regulatory consistency with CBRA on the part of major federal permit programs stems from an assumption of future compliance with the Act and is inconsistent with other proposals. The Study Group infers on page 15 of its "Executive Summary" that, since none of 250 permits issued since passage of the Act "indicate a direct disregard for the purposes of CBRA," that none will ever do so in the future. Leaving such a gaping loophole in the permit granting process can only invite problems in the future. Furthermore, the Study Group rightfully feels the need to mandate compliance with the purposes of CBRA in allowing "improvements" on or near CBRS areas (Section 6(a)(2)). Why then should it not also wish to secure such compliance on the part of those granting permits for the same types of activities?

On the surface, the Study Group's proposal to exclude from the CBRS "otherwise protected" areas held by federal, state, or local agencies may make sense, if one assumes that this protected status would survive, if these lands were sold. The Study Group has recommended inclusion into CBRS privately protected areas and military surplus lands, when such lands are ever sold for purposes of development. Since governmental agencies may also fall under the same temptations to sell, we recommend that "otherwise protected" land sold by

such agencies also be included within CBRS, if such a sale is inconsistent with the purposes of CBRA.

I thank you for this opportunity to express our views on these matters.

Sincerely,

Hope M. Babcock
Counsel,
Natioanl Audubon Society

1056

SIERRA CLUB

National Coastal Committee

11194 Douglas Avenue
Marriottsville MD 21104

20 June 1987

The Coastal Barriers Study Group
Department of the Interior
National Park Service
P.O. Box 37127
Washington DC 20013-7217

Gentlemen:

The National Coastal Committee of the Sierra Club supports the expansion and strengthening of the Coastal Barriers Resources System. Along with a number of other environmental organizations, the Sierra Club's members worked for passage of the 1982 Act and subsequently we have supported the adoption of so-called "mini-CBRA" legislation by state and local governments. The underlying concept that public incentives for placing people, property, and vulnerable ecosystems in jeopardy should be removed continually acquires more relevance as the nation's natural and financial resources alike are becoming increasingly strained. Therefore the 1988 Report to Congress (Draft) merits both commendation and criticism.

Geographic Scope

We support the recommendation that the undeveloped, unprotected coastal barriers of the Florida Keys, Puerto Rico, and the Virgin Islands be added to the CBRS. Geography dictates that emergency evacuation options for the Keys involve unacceptable risks. For public policy to encourage a heightening of this risk is unconscionable.

The statement that "additional study and consideration is necessary before recommendation can be made regarding undeveloped coastal barriers along the Pacific Coast, Great Lakes, Alaska, Hawaii, and American Samoa" is lame and transparent. The fact that their proposed inclusion in the 1985 Report generated controversy underscores the fact that many of these areas are currently threatened with unwise development, while concern mounts over Lake level rise and the incidence of tsunamis. The comment by Mr. Danny Smith when the Report was released in April that areas that are not under immediate pressure need not be included in CBRS bore a curious illogic of its own. We urge that the final Report call for Congressional action to include these areas and for specific study as required to accomplish this.

Associated Aquatic Habitats

We strongly support the extension of CBRS to associated aquatic habitats as inseparable parts of the ecosystem and as areas vulnerable to the effects of development. Both the National Wetlands Inventory and the NOAA Coastal Wetlands Inventory have focussed attention on these aquatic habitats and the need to protect them. Prohibition of federal subsidies for their destruction is an essential first step.

Secondary Barriers

We support the inclusion of secondary barriers.

"Otherwise Protected" Coastal Barriers

We support the inclusion of all "otherwise protected" coastal barriers in CBRS and do not accept the argument that inclusion is not necessary because publicly owned Seashores, Refuges, and Parks are not subject to development pressure. The fact is that coastal parks and refuges are under increasing pressure to expand facilities, structures, and erosion control activities to accommodate human visitors (Assateague and Chincoteague are cases in point). Is development of barriers in the name of public recreation any wiser a public investment or less damaging to the ecosystem than private development? This smacks of the "do as I say, not do as I do" strictures of the stereotypical Victorian hypocrite.

Failing the inclusion of all "otherwise protected" coastal barriers in CBRS, we support the recommendation for automatic inclusion of properties at the point of sale.

Federal Stewardship: The Acquisition Alternative

We support federal acquisition of CBRS lands utilizing user fees but not wholly dependent upon these. As stated above, we do not support exemption of these areas from CBRS, however. We oppose deletion of any Federal coastal barrier property, including military and Coast Guard lands, for the same reasons. Activities related to genuine national security, navigation, etc. are already provided for by the legislation. Exemptions such as these only contradict the intent of the CBRS.

Regulatory Consistency

It is not our understanding that simply withdrawing federal financial support for development can alone achieve complete protection of coastal barriers; why then recommend further acquisition? Reliance on state regulatory programs which are far from uniformly effective is also sidestepping the need for consistent federal policy for coastal barriers. While it would be inappropriate to analyze exhaustively the federal regulatory programs in this Report, reference to the necessity for their working in tandem is not.

Tax Policy Alternatives

We still support consideration of tax reforms which would be consistent with the intent of CBRS.

To drop all reference to tax reform is to retreat from the comprehensive examination of available alternatives for strengthening CBRS.

Other Amendments to CBRA

We support continued work to develop guidance for federal agencies' activities which may indirectly affect CBRS units. We certainly support restrictions on the disposal of dredged material to make them consistent with the conservation goals of CBRS. Emphasis should be given to realistic "beneficial uses".

Recreational development on public lands, we submit, can contravene the purposes of CBRS just as well as private development can if it is not subject to careful oversight. Clarification of the limits of recreational projects within the CBRS concept is not so out of order here. Is it related to acreage, cost, impact on habitat?

We oppose the deletion of OMB certification of federal agency compliance with CBRA, only insofar as it is a perfunctory process. The idea here should be to assure general compliance. We would therefore support a recommendation to that effect, such as asking the General Accounting Office to do the certification.

In general we support the development of alternative guidelines for redevelopment of coastal barriers following major storms and other destructive events. We also support the development of expanded restoration and conservation programs. We look forward to the opportunity to review more detailed proposals than are put forward in the final section of this Report.

We have not commented on the accompanying maps, but we are unequivocally opposed to deletions for any reasons that are founded on considerations inconsistent with the goals of CBRA.

Yours sincerely,

Vivian D. Newman

Vivian D. Newman, Chair
National Coastal Committee
Sierra Club

SIERRA CLUB

1269

730 Pennsylvania Avenue S.E. Washington D.C. 20003 (202) 547-1141

June 23, 1987

Coastal Barriers Study Group
U.S. Department of Interior
National Park Service -- 498
P.O. Box 37127
Washington, D.C. 20013-7127

Re: Comments concerning the Final Draft, Report to Congress: Coastal Barrier Resources System

To Whom it May Concern:

The Sierra Club Great Lakes Federal Policy Project represents more than 400,000 members nationwide who are concerned with the environment of the Great Lakes region. We appreciate the opportunity to comment on the Department's proposed recommendations for the Coastal Barrier Resources System (CBRS). Our comments are restricted to the Department's decision to exclude the Great Lakes shoreline from the recommended expansion of the System. Separate comments addressing the national implications of the proposed recommendations have been submitted by the Sierra Club National Coastal Committee.

The May 1985 draft CBRS report considered expansion of the System to include the Great Lakes coastline. Although we were disappointed by the quality of the National inventory study in the Great Lakes region, we were pleased to see the area included. The Department's recent decision to drop the region from consideration leaves the coastal areas of the Great Lakes open to severe environmental damage.

The coastal barriers of the Lakes protect the mainland from storm flooding and erosion and provide shelter for fragile aquatic ecosystems. These barriers are subject to the same natural forces and development pressures as are the Atlantic and Gulf coasts. The Great Lakes have recently experienced major flooding and erosion problems, due to record-high lake levels. Millions of dollars in federal, state and municipal funds have been spent for erosion control and flood damage. Ultimately, extensive lakeside development must be found responsible for these expenditures. Now more than ever is the time to restrict federally subsidized development on these threatened shores.

We find the Department's explanation that Great Lakes barriers are a different type of geologic structure to be inconsistent. The final draft recommends for inclusion in the System a variety of previously unprotected geologic structures, including those "that function as coastal barriers but are not composed entirely of unconsolidated sediments...bed rock/glacial deposits (New England), carbonate-cemented and mangrove shorelines (Florida Keys and Caribbean), and cheniers (Louisiana). Granitic outcroppings and coral reefs are surely "geologically different structures", yet both were found suited for inclusion in the CBRS.

While we applaud the recommended inclusion of all aquatic habitats associated with the barrier system, we note that the exclusion of the Great Lakes barriers from the system also leaves valuable associated habitats at risk. Similarly, the Department's decision to exclude "otherwise protected" coastal barriers nationwide from protection under the System will leave critical aquatic habitat associated with those areas open to damage.

Serious environmental and fiscal problems have been caused by unwise shoreline development along the Great Lakes. The Sierra Club Great Lakes Federal Policy Project urges that the Department's CBRS Report to Congress recommend a specific study of the Great Lakes coastal barriers, utilizing up-to-date maps and on-site inspections. Based on this study, the region should be included in the CBRS.

Sincerely,

Melanie L. Griffin
Washington Great Lakes Specialist

1316

June 22, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, DC 20013-7127

Dear Sir/Madam:

The National Parks and Conservation Association (NPCA) appreciates the opportunity to review and comment on the Report to Congress: Coastal Barrier Resources System. Although we support your efforts and rationale for deterring development of areas classified as coastal barriers, we have concerns about several of the proposed recommendations.

The decision to exclude islands along the West Coast and Great Lakes shores counteracts the stated intentions of the 1982 Coastal Barrier Resources Act (CBRA), namely to:

(1) minimize the loss of human life,

(2) reduce the wasteful expenditure of Federal revenues, and

(3) reduce damage to fish and wildlife habitat and other valuable natural resources of coastal barriers.

Specifically, NPCA strongly supports:

(1) recommendations to add undeveloped barriers of the Florida Keys, Puerto Rico, and the U.S. Virgin Islands to the System, as well as granitic coastal outcroppings in New England;

(2) the addition of associated aquatic habitats;

(3) recommendations that private, undeveloped inholdings in parks and recreation areas be included in the CBRS boundaries;

(4) consistency among Federal regulatory laws dealing with CBRS;

(5) inclusion of provisions assuring that actions such as channelization (and subsequent disposal of sediment) are consistent with the Act's intentions;

National Parks and Conservation Association
1015 Thirty-First Street, N.W., Washington, D.C. 20007
Telephone (202) 944-8530

(6) expansion of the System to include barriers in large embayments of Delaware Bay, Narrangansett Bay, Chesapeake Bay, and Long Island Sound;

(7) inclusion in the CBRS of qualifying Department of Defense and Coast Guard lands, where no tangible link can be established to national security; and

(8) inclusion of West Coast and Great Lakes areas in the CBRS.

With the passage of time, problems associated with Federal underwriting and subsidy of coastal barrier development will only be further exacerbated. Viewing the costs of such Federal actions in fiscal terms argues for recommended inclusion of significantly greater acreage than that presently proposed by DOI. We appreciate the opportunity to provide these comments and look forward to an improved Coastal Barrier Resources System.

Sincerely,

William C. Lienesch
Director of Federal Activities

WCL/lmb

1075

NATIONAL ASSOCIATION OF REALTORS®

REALTOR®

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June 19, 1987

The Honorable Donald Hodel
Secretary of Interior
c/o Coastal Barrier Study Group
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127

Re: Coastal Barrier Resources System, Draft Report to Congress

Dear Mr. Secretary:

The NATIONAL ASSOCIATION OF REALTORS® is taking this opportunity to comment on the Department of Interior's March 23rd draft report to Congress on the Coastal Barrier Resources System.

The National Association, comprised of more than 730,000 members involved in all aspects of the real estate industry, has a keen interest in proposed changes to the Coastal Barrier Resources System (CBRS) and the Coastal Barrier Resources Act (CBRA) because of the dramatic effect such changes may have on the utility, marketability, and value of private property.

A number of our local boards and state associations of REALTORS®, as well as individual REALTORS®, will be submitting their specific comments to you about particular parcels of land. The NATIONAL ASSOCIATION OF REALTORS® has several generic comments on the draft report.

- The Geographic Scope of the Department's Recommendations is Consistent With the Intent of Congress
- Designation of "Associated Aquatic Habitat" Should be Done on a More Scientifically Precise Basis and in a Manner that Better Reflects the Multiple Purposes of the Act
- Inclusion of Inholdings by Reference Poses Serious Questions Relating to Due Process
- No Amendments to the Tax Code Relating to Coastal Barriers Are Warranted at This Time
- No Amendments to the CBRA Are Needed For Purposes of Regulatory Consistency
- Goals of the Proposed "Joint Study" Aimed at Impeding Redevelopment of Developed Coastal Barriers Should be Re-examined.

A. THE GEOGRAPHIC SCOPE OF THE DEPARTMENT'S RECOMMENDATIONS IS CONSISTENT WITH THE INTENT OF CONGRESS.

The Department of Interior (DOI), while increasing by over 200% the total amount of acreage being recommended for CBRS inclusion, correctly limits system expansion to the East and Gulf coasts. In Section 2 of the Coastal Barrier Resources Act, Congress identified problems unique to coastal systems in the eastern and southeastern portions of the country. Congress determined that loss of human life, wasteful expenditures of federal revenues, and damage to fish and wildlife in certain coastal barrier areas necessitated prohibition on federal expenditures to inhibit further development. However, coastal barrier systems beyond those on the east and southeastern coasts do not experience the same oceanographic and climatological forces as eastern barriers, generally do not experience the same kind of development pressures and thus do not present the degree of hazard to human life, fish and wildlife, and the federal budget that Congress believed was posed by other coastal barrier systems. We agree with DOI's assessment that coastal barrier designations beyond the east and southeast coasts is beyond the intent of PL 97-348.

B. DESIGNATION OF "ASSOCIATED AQUATIC HABITAT" SHOULD BE DONE ON A MORE SCIENTIFICALLY PRECISE BASIS AND IN A MANNER THAT BETTER REFLECTS THE MULTIPLE PURPOSES OF THE ACT.

We are concerned about the somewhat casual manner in which associated aquatic habitat is being designated by the Department of Interior. While it may be appropriate to include adjacent upland portions of a coastal barrier in the CBRS, the DOI appears to be delineating associated aquatic habitat without a precise methodology. Further documentation about those areas that are typically subject to wind, wave, and tidal energy from storms hitting the coastal barrier is needed. DOI's report also lacks details regarding how the other goals of the Act, such as protecting human life and minimizing expenditure of federal funds, are being met by recommending for inclusion such large portions of associated aquatic habitat.

C. INCLUSION OF INHOLDINGS BY REFERENCE POSES SERIOUS QUESTIONS RELATING TO DUE PROCESS.

Owners of "inholdings" within a conservation or recreation area established by Federal, state, or local law should not be included by reference into the CBRS. Inholdings to be recommended for inclusion

should be mapped out with proper notification similar to other private properties. DOI's report, however, contains little information about the quantity, size, and land use patterns of existing inholdings. Without such information, there is no basis in which to determine the need to include these inholdings in the CBRA. DOI is of the belief that conservation and recreation areas are being managed in a manner consistent with the CBRS. So too may inholdings be utilized in a manner consistent with the CBRS, and not require placement in the system.

Inclusion of inholdings raises further questions. Why should inholdings be denied the utilization of federal programs that can be utilized by adjacent city or state property? Will federally subsidized highways in state conservation areas need to veer away from inholdings so that inholders do not have access? Why should a state coastal park be allowed to build parking lots in "sensitive areas" but an inholder be denied flood insurance for an extension on a cottage?

Many of the inholdings would fall below the generally-accepted minimum size requirement for inclusion in the CBRS. We continue to believe that the minimum lot size serves a useful purpose in the establishment of viable and significant areas of protection. Additionally, a proposal to include inholdings by reference could supercede the requirement that only undeveloped barriers be protected.

DOI's recommendation goes further to urge that the coastal barrier held for conservation purposes be automatically included in the CBRS if the not-for-profit owner ever proposes to sell the property for development that is inconsistent with the Act. We oppose the automatic inclusion mechanism and believe only Congress should designate which lands are in the CBRS.

We also oppose the recommendation that exceptions to the automatic inclusion could be made by allowing the Department to develop guidelines for what constitutes acceptable development on private property "consistent" with long-term conservation goals. A property to be developed under those guidelines would be exempt from automatic inclusion. We do not believe that the Department of Interior should be determining what are "acceptable" land use patterns on private land. Congress traditionally has sought to refrain from imposing a federal land use plan on private property, instead appropriately leaving land use planning to those local officials best suited to make such determinations.

D. NO AMENDMENTS TO THE TAX CODE ARE WARRANTED AT THIS TIME.

We strongly support the decision by the Department not to seek tax code changes relating to coastal barriers. The real estate industry is presently struggling to come to grips with the effects of the 1986 Tax Reform Act, the most far-reaching tax reform in recent history. Although the full impact of tax reform will not become apparent for several years, nearly all analysts agree that real estate investor capital, in general, has become more difficult to find and considerably more expensive to attract. An overall national decline in new real estate investment and development is anticipated. This problem is exacerbated in coastal development areas where competitive returns on investments traditionally are more difficult to maintain and we are pleased to see recognition of this fact by the Department of Interior.

E. NO AMENDMENTS TO THE CBRA ARE NEEDED FOR PURPOSES OF REGULATORY CONSISTENCY.

Many coastal communities would submit that major federal permit programs relating to coastal barrier areas already take fish and wildlife values into account. A review of the legislative history of the CBRA shows that the original sponsors also believed that interfering with federal and other types of permits would allow for unacceptable federal intrusion into local land use decisionmaking. We agree with the Department that requiring regulatory consistency at the Federal level would depart from the basic CBRA concept that federal regulatory involvement should be minimized.

F. GOALS OF THE PROPOSED "JOINT STUDY" AIMED AT IMPEDING REDEVELOPMENT OF DEVELOPED COASTAL BARRIERS SHOULD BE RE-EXAMINED.

Congress determined in the original enactment of the CBRA that the multiple purposes of the CBRA would not be met by including developed coastal barriers. Only those coastal barriers where man's activities did not significantly impede geomorphic and ecological processes were considered significant enough to be considered for the CBRS. Thus, we view with concern attempts now by DOI to suggest that through a coalition of federal agencies, the federal government should re-examine its policies about so-called subsidies in developed coastal barrier areas.

The CBRA was originally enacted partly due to perceptions that development of coastal barriers poses threats to fish, wildlife, and other natural resources. If this is the case, then placement of developed barriers in the CBRS would not serve the conservation goal and would be highly inappropriate.

If the federal government re-examines its policies about so-called subsidies in developed coastal barriers because of the cost to the government, then we would suggest that a more accurate picture of the total costs and benefits of current coastal barrier development must be brought to light. Simply looking at past payouts for federal disaster assistance does not adequately reflect the total costs and benefits to the federal government (or, more importantly, to society) of existing coastal barrier development.

If a joint study is to occur, certainly the Department of Commerce and the Small Business Administration should be participating so that the full range of options and impacts relating to redevelopment of coastal barriers following storms can be explored. Furthermore, the study of disaster assistance and redevelopment should cover all areas in the country vulnerable to natural hazards including other floodplains, tornado prone areas, earthquake prone areas, drought prone areas, etc.

We also disagree with DOI's characterization of current policy in developed coastal barrier areas as "simply replacing the structures that have been damaged or destroyed." Developed coastal barrier areas must comply with the Federal Emergency Management Agency's (FEMA) rules for redevelopment after a storm. In some areas, FEMA has purchased properties that are continually being damaged. In other areas, reconstruction following a storm involves a wide variety of floodproofing technologies

and land use techniques to minimize the damage during future storms. In summary, through the National Flood Insurance Program (NFIP), there are a wide variety of mechanisms to guide communities in careful and wise reconstruction following a flood.

G. MISCELLANEOUS

Description of Coastal Barrier

We believe that the second and third paragraphs on p. 5 of the Draft Report to Congress give a somewhat distorted view of the current situation on coastal barriers. The statistics used for flood damages and flood insurance seem to relate to coastal communities, only a very small portion of which, on the average, are coastal barriers. Indeed if the Department of Interior has such information for coastal barriers, publication would be most useful. We believe that the report should spell out that this type of data is not a current description of the situation on coastal barriers, but of coastal communities.

We believe it also appropriate in these paragraphs where the magnitude of the financial obligations of the National Flood Insurance Program is discussed, to mention that insurance for new development in coastal areas is not subsidized by the U.S. government. Applicants for federal flood insurance for all new construction pay the full actual rates that reflect the risks, and so the government is minimally at risk with all new properties coming under the NFIP.

NFIP imposes stringent building construction safety standards on all new construction and substantial improvements in flood hazard areas where their insurance is available. This has resulted in much safer construction in the nation's floodplain areas than would have taken place absent the requirements of that program. This safer construction has had the positive effective of reducing the potential for loss in such areas.

A study completed for the Corpus Christi, Texas, Barrier Island Task Force compares flood damages in coastal areas to those in inland areas, and found that the greater risk to the government occurred in the inland areas. The study concludes that the amount of insurance claims paid to property owners in inland areas in Brazoria County Texas far exceeds claims paid to coastal areas even though the coastal areas had twice the number of policies and 60 percent more insurance coverage in dollar terms than inland areas.

We appreciate this opportunity to comment on the Department's draft report and look forward to working with the Department of Interior as it prepares its final recommendations to Congress.

Sincerely,

William M. Moore
President

1100

National Association of Home Builders
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James M. Fischer, Jr.
1987 President

June 16, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D. C. 20013-7127

Dear Sirs:

On behalf of the 149,000 members of the National Association of Home Builders, I would like to comment on the Draft Executive Summary of the Coastal Barriers Study Group's Report to Congress, which contains proposed recommendations for additions to and deletions from the Coastal Barrier Resources System (CBRS). I understand that the Secretary of Interior has no authority to make modifications to the CBRS, only to recommend them, and that any actual modifications to the System will require legislative amendments to the Coastal Barrier Resources Act of 1982.

Associated Aquatic Habitats

Most of the categories of aquatic habitat that are considered to be "associated aquatic habitats" in this Draft Report were included in the 1982 statutory definition of undeveloped coastal barriers. However, because this Draft Report represents the first opportunity we have had to see how such areas actually would be delineated, we believe this to be an appropriate time to present our concerns with the proposed additions. In several cases, the boundary of the associated aquatic habitats proposed for inclusion in the CBRS appears to fall immediately adjacent to mainland areas. In many other instances, because of the fact that the seaward edge of the associated aquatic habitat begins at the landward edge of the coastal barrier island, this boundary is also immediately adjacent to developed portions of coastal barriers. In our view, these delineations could interfere with the legitimate provision of access and facilities to existing development, which might require intrusion within the boundaries

of delineated aquatic habitats in the CBRS in order to reach the developed areas. We believe allowances should be made in the statute for selecting the environmentally preferable location or route for such facilities when they are necessary to serve existing developed areas.

Section 5(a)

A related concern is the recommendation that the Department of the Interior develop guidance for Federal agencies to clarify Section 5(a) of the Coastal Barrier Resources Act (CBRA), which prohibits Federal funding for activities within CBRS units. Specifically, DOI seeks to clarify that Federal funding for a facility located outside a CBRS unit whose direct purpose is to provide a tangible product, such as water, sewer, or electricity, within the CBRS unit is restricted by CBRA.

We urge the Department of the Interior to give adequate consideration to the legitimate service needs of existing development in areas that are adjacent to, but not part of, the CBRS system when drafting these guidelines. The 1985 Draft Report, which serves as the background document for the 1987 Draft Report, mentions cases in which utilities were constructed up to the edge of a CBRS unit using Federal funding and later extended inside the CBRS unit using private, State, or local funding. While we understand the Department of the Interior's concerns in this regard, there is a strong public interest in continuing to provide adequate facilities to properties in developed areas that are adjacent to CBRS units. Rigid guidelines could interfere with meeting these legitimate needs, and we believe that situations such as those described in the 1985 Draft Report easily could be avoided through the review process for permit applications for utilities and infrastructure without jeopardizing the needs of adjacent development.

Phased Development Exclusion

We believe that the 1987 Draft Report is remiss in not discussing the status of the phased development exclusion. The 1985 Draft Report recommends elimination of this exclusion, yet the 1987 Draft Report does not mention the exclusion at all. Does this mean that the exclusion is retained from the original act, or that it is being eliminated as suggested by the 1985 Draft Report?

In the existing CBRA program, allowances are made for excluding areas that are part of a phased development. In other words, if

no visible structures or infrastructure yet exist but, to quote the 1985 Draft Report, "commitments or legal arrangements necessary for and leading toward construction of either structures or infrastructure have been provided in a publicly documented plan being carried out in a diligent manner in general agreement with the schedule outlined in the original plan," such as-yet undeveloped areas would not be included in the CBRS as undeveloped coastal barriers.

In light of the fact that new additions to the CBRS system are being proposed in the 1987 Draft Report and the fact that identification of undeveloped coastal barriers has relied heavily on visible evidence of development taken from aerial photographs, we believe that the phased development exemption should be retained. Substantial investments of time and money typically occur in a development project well before visible evidence of that project appears on the ground.

Delineation Criteria

In line with our immediately preceding comments, we question the appropriateness of delineating protected areas according to where development has or has not occurred. We voiced this concern in the 1981 hearings on CBRA and continue to believe that the delineation criteria should be resource-based. Areas capable of accommodating development should be identified, leaving fragile barrier that are incapable of supporting development as designated CBRS units.

Consistency with Flood Insurance Administration Rules and Regulations

One concern we have with the existing CBRA system as well as the proposed additions relates to the application of the National Flood Insurance Program (NFIP). The NFIP requires communities to adopt minimum floodplain management standards for all identified flood hazard areas within their jurisdiction. In return, the Federal Insurance Administration (FIA) extends national flood insurance to all properties in that community.

Conceptually, a community's jurisdictional boundaries could be split under the CBRA system, with the developed portion of the community left outside the CBRS and the undeveloped portion included within the CBRS. The question raised by this hypothetical, but possibly quite real, situation is whether the FIA's NFIP rules could be enforced in this situation, since flood insurance is made applicable on a community-wide basis in exchange

for adoption of standards that are applicable on a community-wide basis. We believe that this inconsistency between the FIA and CBRA programs is at the very least a conceptual problem that needs to be resolved.

Private Property Rights Considerations

In light of the recent Supreme Court decision in First English Evangelical Lutheran Church v. Los Angeles County, 55 USLW 4781 (June 9, 1987), CBRA raises the taking issue to the extent that, as applied to a particular property, it may render that property useless. This could be construed by a court as a taking of private property, for which compensation would be due. Because the Draft Report was prepared by DOI prior to this court decision, we suggest that DOI reevaluate its recommendations in light of the decision.

CBRA'S Financial Sanctions and Regulatory Approach

CBRA not only prohibits direct federal loans to development within CBRS units, but effectively prohibits the issuance of loans from privately owned, commercial lending institutions that are federally insured by making national flood insurance unavailable to properties within the CBRS. Under the terms of the Flood Disaster Protection Act of 1973, federally insured or regulated banking institutions are not allowed to issue loans to properties in flood hazard areas that do not have national flood insurance.

NAHB opposes this approach as an unnecessary intrusion of government into private markets and an inappropriate regulatory approach to land use control. We believe a program of standards applicable to development in sensitive environmental areas, such as exist under the National Flood Insurance Program and numerous other environmental regulatory programs, to be much more direct and effective than CBRA's broad prohibitions of federal financial assistance to development.

We appreciate the opportunity to comment on the Draft Report to Congress. If there is any additional information that we can provide, please do not hesitate to contact me.

Sincerely,

James M. Fischer, Jr.

James M. Fischer, Jr.
President

1490

American Resort & Residential Development Association™

1220 L Street, N.W., 5th Floor
Washington, D.C. 20005
(202)371-6700

June 23, 1987

The Honorable Donald Hodel
Secretary of Interior
c/o Coastal Barrier Study Group
National Park Service
P.O. Box 37127
Washington, DC 20013-7127

Re: Coastal Barrier Resources System, Draft Report to Congress

Dear Mr. Secretary:

The American Resort and Residential Development Association is taking this opportunity to comment on the Department of Interior's March 23rd draft; Report to Congress: Coastal Barrier Resources System.

By way of background, A.R.R.D.A. represents leading national and international companies that develop and finance recreational, resort and residential real estate, including vacation homes, condominiums, resort timesharing, planned unit developments, new and retirement communities, mobile home parks and campgrounds. Our members range from small, privately held development companies to real estate development subsidiaries of major corporations and lenders.

Our comments which follow attempt to address the broad generic issues. Our individual members with particular local concerns will comment on particular parcels of land and more localized issues.

Proposed Recommendation for Additions or Deletions from the CBRS

A. Geographic Scope

We concur with your decision not to recommend expansion of the geographic scope to include the West Coast & Great Lakes as consistent with Congressional interest.

B. Associated Aquatic Habitats

Although we are certainly familiar with the rationale for further additions in this area, the proposed criteria is much too ambiguous and arbitrary. Unlike the 1982 process, the current proposal gives no guidance for the map maker nor the affected public.

C. Secondary Barriers

We oppose the inclusion of "secondary barriers" within CBRS. The original interest of this initiative was to deal with coastal barriers subject to direct wind, wave, and tidal energy. These secondary barriers do not meet this criteria. As importantly this inclusion in our opinion goes beyond the geographic scope envisioned by Congress.

The Congressional sponsors made it clear the major thrust of this legislation was to reduce federal financial exposure and expenditures in coastal barrier areas. We are unaware of major federal losses or exposure in these "secondary barrier" areas. The protection of fish and wildlife habitats is cited as a major reason for including secondary barriers. Given this line of reasoning virtually any water body and wetland could be included within the CBRS. Without further documentation and evaluation this recommendation seems arbitrary at best.

Proposed Conservation Recommendations

A. Federal Stewardship: The Acquisition Alternative

We concur with the department's recommendation that acquisition efforts of CBRS lands be pursued by all levels of government. In general we feel this is the most effective and fairest method for all parties concerned, including the private property owner.

From the conservation perspective, this approach ensures retention of environmental values and long term protection while also fairly compensating the landowners. Also the acquisition alternative forces the government agency to prioritize those areas with maximum environmental values.

C. Tax Policy Alternatives

We applaud the department's proposal to not pursue new tax policies for these areas. Given the market disruption caused by the two year consideration of the Tax Reform Act of 1986, we are in total agreement that certainty in the tax policy area is necessary. In addition, the new policies found in the 1986 Tax Reform Act should serve to some extent the preservation goals of your original tax proposals. It is generally anticipated the new tax provisions will diminish overall real estate investment and development activities.

D. Other Amendments to CBRA
"Section 5"

We oppose attempts to limit federal funding of facilities located outside of the CBRS that may serve CBRS units as long as book-ups, roads, etc. within those units are privately financed. We do not believe further limits should be imposed in this area. Although it was repeatedly stated during Congressional debate of CBRA that this law was not intended to deny private use of private property within CBRS, this approach would in many cases end up doing this. Additionally this approach could end up denying landowners adjacent to the CBRS federal programs generally available to all other areas of the nation. We strongly believe this was never Congressional intent. The net effect of this type of approach is greater uncertainty in these areas which in turn causes economic harm to the economy and local landowners.

"Technical Assistance Prohibitation"

According to field reports, the prohibition on technical assistance has resulted in cases where the Corps of Engineers has refused to do on-site inspection of wetland areas under their dredge and fill permit program responsibilities. This frustrates environmental goals and sound land management objectives. We would appreciate a review of this problem.

Conclusion

We appreciate consideration of our views contained herein. We would like to briefly address an issue surrounding the "phased development" exemption, not included in your report to Congress. It has come to our attention that some Department officials have recently been questioning and possibly reversing exemption decisions made on the basis of the "phased development" criteria utilized during and following enactment of the CBRA. We would strongly oppose policy reversals in this area. Business and personal decisions of major economic magnitude were based on these previous rulings. To come back now and change the rules in this regard is patently unfair. Although we recognize the need for and in many cases support redesignations based on technical data, we oppose wholesale policy changes in such areas as the "phased development" exemption which was utilized to bring fairness to the process and to recognize the economic realities of the development process.

We look forward to working with the Department as final recommendations are formulated for submission to Congress.

Sincerely,

Thomas C. Franks
Vice President
of
Government Relations

TCF/alr

cc: Gary Terry, President - ARRDA
Carl Berry, Chairman - ARRDA
Chuck Hannig, Chairman, ARRDA Legislative Committee

1560

NATIONAL TAXPAYERS UNION

A NONPARTISAN NONPROFIT ORGANIZATION DEDICATED TO THE PUBLIC INTEREST

325 PENNSYLVANIA AVENUE, SOUTHEAST WASHINGTON, DISTRICT OF COLUMBIA 20003 TELEPHONE AREA CODE 202 [illegible]

July 28, 1987

Ms. Barbara Wyman
Chairwoman
Coastal Barrier Study Group
U.S. Department of the Interior
National Park Service-498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Chairwoman Wyman:

On behalf of the National Taxpayers Union, a 150,000-member organization dedicated to protecting the rights of the American taxpayer, I would like to express our support for expansion of the Coastal Barrier Resources System.

The National Taxpayers Union was a strong backer of the Coastal Barrier Resources Act in 1982 and we continue to support its goal of reducing wasteful expenditure of taxpayer dollars for unsound coastal development. We oppose the continued use of federal expenditures to protect new development on unstable coastal barriers. The costs and risks of new development in these areas should be borne by the developer -- not the American taxpayer.

The National Taxpayers Union supports the expansion of existing units along the Atlantic and Gulf Coasts, as well as the addition of new areas such as the U.S. Virgin Islands, Puerto Rico, New Jersey, Maryland, the Florida Keys, and secondary barriers in large embayments. We also strongly believe that taxpayers should not be required to subsidize unwise development on the Great Lakes and Pacific coasts and strongly urge you to reconsider your decision not to include these coasts within the System. In addition, we oppose any deletions to the System, including military and Coast Guard lands.

The Coastal Barrier Resources Act has provided a means to prevent the wasteful expenditure of hard-earned tax dollars for flood insurance, disaster relief and federally-subsidized development in hazardous areas. We urge you to utilize this opportunity to properly recommend strengthening the implementation of this important piece of legislation.

Thank you for the opportunity to comment.

Sincerely,

David Keating
Executive Vice President

THE AMERICAN TAXPAYER ACTS THROUGH NTU

DK 9:28

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ANTI-VIVISECTION SOCIETY OF AMERICA, Inc.

11 BEACON STREET, SUITE 314

BOSTON, MASSACHUSETTS 02108

TELEPHONE
227 8647

March 30, 1987

Mr. Dan Smith
Assistant Secretary for Fish,
Wildlife and Forests
Interior Department
Washington, D. C.

Dear Secretary Smith:

Our Society favors your department's decision to expand the network of coastal areas which in effect will place more land which are in high risk areas and include them in the National Coastal Barrier Resource System. This will result in the preservation of the natural habitats of countless wildlife. We favor your decision which will result in further protection of fragile ecosystem properties. Private developers should be denied the opportunity to develop lands which result in the death of countless animals.

We further feel that even more land than was included in your recent announcement concerning at risk property could be added to the System.

Sincerely yours,

Bernard Harmon, President

BH:jg

230

654

HABITAT INSTITUTE FOR THE ENVIRONMENT

10 Juniper Road, Box 136, Belmont, Mass. 02178 (617) 489-5050

May 27, 1987

Coastal Barriers Study Group
Department of Interior
National Park Service-498
P.O. Box 37127
Washington, D.C. 20013

To Whom It May Concern:

I am writing in regards to recommended changes in the The Coastal Barrier Resources Act. I support the proposed additions of 1,010,646 new acres in the Coastal Barrier Resource System and in addition urge the the Great Lakes and the Pacific coast be included in the system.

David Keith Winsten

A Non-Profit Corporation Devoted to Environmental Education

1140

CRAC coastal resources advisory committee

a forum of citizens, umbrella groups, academic institutions and local, state and federal agencies to provide guidance toward best uses, conservation and preservation of Maryland's coastal area resources

Cecily Majerus
Executive Secretary
Coastal Resources Division
Tel: (301) 974-3382

June 15, 1987

Mr. Frank B. McGilvrey
Coastal Barriers Coordinator
Fish & Wildlife Service
Department of the Interior
Washington, D.C.

Dear Mr. McGilvrey,

The Coastal Resources Advisory Committee to Maryland's Department of Natural Resources, has reviewed the report to Congress: Coastal Barrier Resource System, Executive Summary. The committee appreciates the opportunity to review the draft recommendations and submits the following suggestions for consideration.

1. The 1987 Coastal Barrier Resources System (CBRS) report has been amended to include large embayments, such as the Narragansett and Chesapeake Bay into the CBRS system. The Coastal Resources Advisory Committee recommends that the document be further amended to include small embayments with coastal barrier characteristics which meet the criteria of the CBRS system.

2. The 1987 CBRS report excludes military installations from the requirements of the program. The committee recommends that when new military installations, or undeveloped portions of existing military installations are considered for development the requirements of CBRS system be included in evaluating the proposed military site.

3. The task force recommends that all original areas which meet the criteria for the CBRS program should be kept in the program and that sites should only be omitted from the program if they clearly do not meet the criteria.

Thank you again for the opportunity to comment on this draft report.

Sincerely,

Mary Dolan

Mary Dolan
Chairman

MD:CM:pb

MARYLAND COASTAL ZONE MANAGEMENT PROGRAM
Tawes State Office Building, B-3 • Annapolis, MD 21401
TTY for Deaf—Baltimore 269-2609, Washington Metro 565-0450

231

1095

GULF COALITION FOR PUBLIC HEALTH

June 22, 1987

Coastal Barriers Study Group
National Park Service
US Department of the Interior- National Park Service 498
PO Box 37127
Washington, D.C 20013-7127

Dear Study Group:

The Gulf Coast Coalition for Public Health is a citizen advocacy group concerned with the effect of man on his environment. GCCPH deals primarily with coastal and ocean related issues as well as the disposal and treatment of hazardous waste.

"The Coastal Barrier Resources Act (CBRA) was designed to restrict federally subsidized development of undeveloped coastal barriers along the Atlantic and Gulf coast in order to:

1. minimize the loss of human life
2. reduce the wasteful expenditure of Federal revenues, and
3. reduce damage to fish and wildlife habitat and other valuable natural resources of coastal barriers.

WHAT ARE THE ISSUES?

I. **The focal issue is not developers and jobs vs environmentalists and birds. The issues are HUMAN.**

II. **The issues involve PHILOSOPHICAL DECISIONS about development, profit, loss, economics, jobs, AND the stewardship of the land. These issues frequently conflict with each other.**

III. **THE ISSUE IS FEDERAL EXPENDITURES. How should the federal government spend our money? The thrust of Coastal Barriers Resources Act is to get the federal goverment out of the risk business.**

512/421-BURN
P.O. BOX 3011
HARLINGEN, TEXAS

III. THE ISSUE IS RESPONSIBILITY: WHO is to look at the cumulative impact of unbridled development and decide ---WHAT do we protect? WHO will make those hard choices? HOW MUCH is enough and what is too much? And will those decisions be made before its too late?

V. The issue of LONG TERM COSTS: What are the additional costs to society?

1. BEACH REPLENISHMENT -- WHO PAYS? HOW MUCH? In 1982 Ocean City, New Jersey spent $5.2 million in a city/state funded project. The beach disappeared in 2.5 months! Long Beach's beach restoration cost $4.5 million for a 3 mile stretch and was gone in 1.5 years. Miami spent $54 million for a stretch of 10.5 miles. Beach replenishment costs are skyrocketing. As the federal government moves out of the subsidy game, who will pay the bill for beach replenishment? Will those who made millions developing these areas be responsible for future beach replenishment? Citizens who want development in the hope of jobs may not want the additional tax burden caused by the need to constantly replenish these beaches and what are the additonal cost in times of disaster?

Perhaps we should just require developers to build a sea wall. But then what did we come to the shore for---to sit on a wall? Is it possible to include in the law the requirement that those who build on barrier islands must bare the cost of their rebuilding? Should those who labor in the fields and factories be required to subsidize those who profit from degredation of our natural resources?

2. COASTAL BARRIERS HAVE A FUNCTION IN OFFERING THE **MAINLAND PROTECTION FROM STORMS, WAVES AND EROSION.** What is the cost to those who live on the other side of the coastal barrier, and who are now protected by the barrier islands?

3. **Loss of human life** is real in time of hurricane or tidal wave. There are now 7 million people exposed to hurricane danger along the Gulf and Atlantic Coasts. Ask the hurricane experts where we should build. What are the issues of public safety? How do we morally justify building in areas which we know are hazardous ?

4. WHAT ARE THE COSTS TO OUR **AQUATIC HABITAT**-- THE MARSHES, ESTUARIES, INLETS AND NEAR SHORE WATERS? WHAT IS THE COST IN PERMANENT **LOSS OF BREEDING GROUNDS FOR THE FISH** WE EAT? What will be the impact to them and who will pay? This cost is difficult to determine as each development will be different. However we must realize that there will be losses and deterioration at a time when citizens are demanding more fish not less.

5. Is there a potential cost in loss of **jobs**? Citizens clamoring for jobs cannot be expected to understand the complex issues and the effects of shifting sands and problems of building on barrier islands. Those who have the knowledge and the power to act must act in the best interst of **all.**

In public hearings speakers and protestors were very vocal about unemployment. The fear of the unemployed is that restrictions imposed on coastal barriers will destroy their hope of jobs. Logic tells us that if there are building restrictions on barrier islands and if people want to live near the coast, then developers will still develop as close as possible to the coastal areas. Coastal barriers are not the only areas where coastal development is possible. Coastal development can still take place in a reasonable manner with responsible building set backs. Jobs may not be the real issue. **The real issue may be who has bought the land and land speculation.**

There is serious question whether additional land is needed for development at this time. The economy and population cannot support the current development on South Padre Island and the numerous unoccupied buildings and bankruptsies are stark reminders. What is the need to open up more land to development when existing developments are unoccupied? What are the costs to those who have ventured into existing land developments when more lands are added? Doesn't their property value go down?

Owners of property along undeveloped coastal areas are speculating on land development. They bought the land with high hopes but with no guarantee that a large cash return would be forthcoming. Now the argument is put forth that the federal government through coastal management is taking away their "chance for profit." If the federal government decides to buy their land then let those people be compensated by returning to them their original investment. It is not the federal government's responsibility to compensate for "fantasies of profit". A 1981 study by Miller which appeared in Environment estimated that the cost to the government of extending current development to the remaining coastal barriers would be five times greater than the cost of public acquisition.

6. How much does **federal flood insuranace** cost this country? Federal flood insurance is trying to become actuariary sound for a normal loss year, but in catastrophic years it cannot operate in the black. We have been told that in 1985-86 for every $1.32 which is paid out only $1.00 is collected by the Federal Flood Insurance Program. While the balance is getting better than the former $2.50 + paid out for every $1.00 collected, it is certainly not self supporting even in a non-catastrophic year. (We been trying to verify facts with FEMA).

7. The **repetitive loss situation is a serious budgetary problem.** It is our understanding that 40 percent of the losses are paid out to 2 % of the policy base. (Seeking verification on this information.) There is no incentive for individuals to mitigate their loss situations if the Flood Insurance Program does not require dramatic increases in premiums for repetition loss situations. Here again the public pays for the privileges of a few. We support the DOI proposal for a joint study by DOI,DOD,FEMA and NOAA to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers after major storms.

8. What is the **cost to cities and towns**? They are beginning to take a second look at the cost of coastal development. When a disaster strikes, local governments are frequently left without the necessary resources to rebuild the lost public properties (road repairs, sewer damage, community facilities, parks etc.). Those short term tourist dollars become very expensive in the long run for locals. The federal government may no longer pay the bill.

9. **Federal expenditures are the bottom line.** How much do we spend on disaster relief? Does this country want to spend its dwindling resources under Gramm Rudman on barrier island coastal development. The costs are well documented. Between 1981-1985 23% of presidentally declared disasters involved coastal flooding and 45% ($265 million) of Federal disaster aid obligations were attributable to coastal damage (Platt, R..H. Congress and the Coast). Galveston suffered $750 million in damages in 1983 and in 1985 hurricanes cost $1 billion in federal payouts. By 1990 seventy-five percent of the population will live within 50 miles of a coast. How high will the cost skyrocket in the 1990s?

"The General Accounting Office (GAO) found that "flood insurance provides financial security to lenders and builders and, by requiring that buildings meet certain standards, gives communities greater confidence to allow construction in such areas." (Coast Alliance, And Two If by Sea, p.5). Rather than flood insurance that promotes complacency perhaps barrier islands should have a warning sign like cigarette packages -- **Build at Your Own Risk.**

In addition to these nine costs consideration, several other issues must be addressed.

--- What is wrong with environmentally sound development within safe set back requirements? Why should all people provide a safety net and a guarantee of imbursement for a private dev\ pment in a hazardous zone?

--- Should the federal government protect from risk and encourage a private developer to build on a washover island.. on a beach of shifting sand?

--- Should the federal government be in the business of subsidizing one type of land development and not another?

--- In the **Gramm Rudman era of reduced federal expenditures** and federal intervention, can we justify this policy of federal risk taking and expenditures in order to develop areas which we know will have serious fiscal and environmental results?

One local issue which needs to be readdressed is the boundary effecting the Port of Brownsville. The Port has suggested that the boundary be moved south to allow for maintainence and dredging in the ship channel. The Brownsville Port is a public issue and should not be confused with private development issues. GCCPH would support this proposal for the Port of Brownsville.

GCCPH supports the recommendation concerning privately owned property within a conservation or recreation area, and privately own undeveloped coastal barriers held for conservation purposes if the not-for-profit owner ever proposes to sell the property for development. Guidelines are definitely necessary.

The current atmosphere in Texas due to the decline in oil revenue is very worrisome. Politicians and developers are crusading for total freedom to pursue tourism -- the future savior of the Texas economy. We support well planned tourist development. Coastal development will obviously be a part of the tourist industry. But we encourage restraint -- responsible development. Someone must act courageously and look at the total public good. Each county is pressured by its own local developers with promises of millions for local tax base and jobs for all. Who is looking to see if these promises are shallow hopes or just dreams built on shifting sands? And most important of all -- it is just not one development but the importance of looking at the **cumulative impact** of all these proposed developments on our state, our coast, our wetland and our marine economies before we seek the final answer.

The **need for public education** is crutial to the development of good public policies with respect to our nation's coast. Coastal barrier residents, local government officials, state officials and citizens at large need to develop a better understanding of our coastal barriers.

The essense of our comment was most accurately stated by John Friend, Jr of Mobile, Ala. in an address to the Symposium on Natural Resources of the Mobile Bay Estuary. In that presentation he addressed the **Prosperity Equation** and stated:

Economic growth plus the quality of life equals prosperity. Take away either economic growth or the quality of life and you do not have progress.

It is evident, therefore, that development and environmental quality are two sides of the same coin. Without growth, environmental quality cannot be afforded, and without the amenities provided by environmental qualtiy, it is obvious that growth cannot be sustained. **Development and environmental quality are therefore interdependent -- not mutually exclusive** as is so often proclaimed.

Sincerely,

Joan B. Brotman
Coordinator

622

CLF Conservation Law Foundation of New England, Inc.

3 Joy Street
Boston, Massachusetts
02108-1497
(617) 742-2540

May 29, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Re: Draft Section 10 Report to Congress and Proposed Recommendations for the Coastal Barrier Resources System (52 Fed. Reg. 9618-9619, March 25, 1987)

Dear Sir/Madam:

The Conservation Law Foundation of New England, Inc. (CLF) is pleased to submit the following comments on the Coastal Barriers Study Group's Draft Report to Congress and its proposed recommendations for additions to and deletions from the Coastal Barrier Resources System (CBRS) and for conservation of the CBRS' natural resources under Section 10 of the Coastal Barrier Resources Act (CBRA). CLF is a non-profit, public interest, environmental law organization dedicated to the conservation and preservation of New England's environment, including its coastal resources.

CLF also submitted comments on the Coastal Barriers Study Group's draft maps, definitions, and delineation criteria for the CBRS in 1985. We attach a copy of those comments and incorporate them by reference.

I. Proposed Recommendations for Additions to or Deletions from the CBRS

A. Geographic Scope

CLF supports the proposed inclusion of the Florida Keys, Puerto Rico, and the Virgin Islands in the CBRS. The ecological and mainland protection values of the barriers in these areas, combined with the severe development pressures they are experiencing, make their inclusion in the CBRS timely and essential.

We are disappointed, however, by your decision not to recommend the inclusion of the Great Lakes and Pacific Coasts in the CBRS. The initial inventory included 269 units from these regions. Barriers along these coasts perform the same beneficial

functions, provide similar fish and wildlife habitat, and experience the same storm damage/subsidized reconstruction cycles as the rest of the nation's coastal barriers. Their inclusion in the CBRS would be consistent with both the interests enumerated in the CBRA and the Department's proposal to expand the definition of a "coastal barrier" to include geological formations that are different from the originally protected areas of the Atlantic and Gulf Coasts but function as coastal barriers (see Section I.C below). We urge you to reconsider your decision and to recommend inclusion of the Great Lakes and Pacific Coasts in the CBRS.

B. Associated Aquatic Habitats

CLF welcomes the proposed recommendation to include all associated aquatic habitats in the CBRS. Their inclusion would recognize their inseparability from the other parts of coastal barrier ecosystems and eliminate the inconsistency between the CBRA's definition of "undeveloped coastal barrier" (which includes associated aquatic habitats) and the extent of the existing CBRS.

C. Secondary Barriers

As a New England organization, we are particularly pleased to see the proposed recommendation to include secondary barriers in the CBRS. Large embayments such as Long Island Sound, Narragansett Bay, and Buzzards Bay in Massachusetts provide many examples of secondary barriers, which, while generally smaller than high-energy barriers exposed to the open ocean, nevertheless perform all the functions of other coastal barriers.

D. "Otherwise Protected" Coastal Barriers

CLF supports the inclusion of all eligible "otherwise protected" areas in the CBRS. To that end, we support the proposed recommendation to include all privately owned areas within conservation or recreation areas established by federal, state, or local law (inholdings), in the CBRS, as well as any land held for conservation purposes by private groups if the land is later sold for development. Moreover, we urge you to work with Congress on developing your suggested amendment to the CBRA that provides for guidelines to aid in determining whether development in such inholdings is consistent with the interests of the Act. However, we firmly believe that the proposed recommendation does not go far enough, and that inclusion of "otherwise protected" areas within the CBRS is desirable.

It is not safe to assume that all federally supported projects in these "otherwise protected" areas will be consistent with the conservation goals of the CBRA. A prime example in New England is the Fish and Wildlife Service's proposal several years

ago to build a large headquarters and visitor center within the Parker River National Wildlife Refuge on Plum Island, Massachusetts. It took a combination of lengthy negotiations between the government and a coalition of environmental groups (including CLF), congressional intervention, and financial assistance from a private conservation organization to convince the Fish and Wildlife Service to site its building at an off-island location. A more current example is the proposal by the Assateague Island National Seashore in Maryland to spend millions of dollars on a beach nourishment project in an attempt to stop erosion along the northern portion of the island -- a project with little chance of long-term success and whose primary immediate beneficiaries will be private developers who want to build in high-hazard floodplain areas on the mainland.

"Otherwise protected" areas should be included in the CBRS, with appropriate guidelines that allow federal expenditures within these areas but restricts it to those projects that are consistent with the interests of the CBRA.

E. Expansion of the Definition of "Coastal Barrier"

We fully support an expanded definition of "coastal barrier" to include landforms that function as coastal barriers but are not composed entirely of unconsolidated sediments. Among the areas that would be added to the CBRS under the broadened definition are the granitic bedrock outcroppings and glacial deposits that are so common in New England.

F. Proposed Additions/Deletions in New England

As noted above, we have attached a copy of our comments on the 1985 draft maps, definitions, and delineation criteria. Those comments contained detailed discussions of our views on the proposed additions and deletions to the CBRS in New England. We ask you to refer to those comments, and offer the following additional comments.

1. Maine

We reiterate our support for maximum protection of coastal barriers in Maine, particularly along the southern coast, where development pressure is greatest.

2. New Hampshire

We are informed by the New Hampshire Office of State Planning that Wallis Sands Beach and Rye Harbor (NH-01 and NH-02), which were included in the 1985 inventory, have been eliminated from further consideration because they are already developed. This differs from the reason given previously by Governor Sununu and the Office of State Planning for eliminating

these units, i.e., that they are not coastal barriers (letter from Governor John H. Sununu to Secretary James Watt, March 31, 1983; letter from David G. Scott, Acting Director, Office of State Planning to J. Craig Potter, March 20, 1985). We suggest that the Coastal Barriers Study Group reexamine the available information about these units and the reasons for eliminating them from further consideration.

The remaining units in the 1985 inventory (NH-03, NH-04, and NH-05) have evidently been excluded because they are "otherwise protected." Mr. Scott's 1985 comments on one of these areas, Hampton Beach State Park (NH-05) referred to the consequences of inclusion in the CBRS on "future development of the State Park." This underscores the importance of including such areas in the CBRS.

3. Massachusetts

CLF supports all proposed recommendations for expansion of the CBRS in Massachusetts. The decision to exclude all "otherwise protected" areas is felt strongly in the Commonwealth, affecting such areas as the Parker River National Wildlife Refuge (MA-02), portions of the Cape Cod National Seashore (MA-17, MA-18, MA-19, and MA-20), the Monomoy National Wildlife Refuge (MA-21), and Waquoit Bay (C-18).

4. Rhode Island

We reiterate our support for maximum inclusion within the CBRS, especially in the vicinity of Little Compton and the Sakonnet River, including Little Compton Ponds (D-01), especially Tunipus Pond and Briggs Marsh; Brown Point (RI-01), Fogland Marsh (D-02); Sapowet Point (RI-02); Sandy Point (RI-03); Almy Pond (RI-06); Hazards Beach/Lily Pond (RI-07); Green Hill Beach (D-04); East Beach/Charlestown Beach (D-05); and Misquamicut Beach (RI-14). We oppose any deletion from the Little Compton Ponds unit (D-01). In addition, we urge full inclusion of Easton's Pond (RI-05).

5. Connecticut

Once again, we support full inclusion of all identified eligible areas in Connecticut. We echo the comments of the Connecticut Coastal Zone Management Program, which has called for inclusion of all "otherwise protected" areas with appropriate guidelines for allowable projects. Connecticut would especially benefit from adoption of the proposed recommendation to include secondary barriers in the CBRS.

II. Proposed Conservation Recommendations

A. Deletion of Military and Coast Guard Lands

Buried in the draft report's section on "Federal Stewardship: The Acquisition Alternative" is the proposed recommendation that the areas currently included in the CBRS on military and Coast Guard lands be deleted. We reject this proposal, and the underlying assumption that all military spending is essential for national security. Coastal barriers owned by the military and the Coast Guard are no different from other undeveloped coastal barriers, and need and deserve just as much protection from unnecessary development. We call on you to drop this proposed recommendation and keep the military and Coast Guard on an equal footing with private landowners and other federal agencies. Environmental laws should apply equally to all parties, public and private.

B. Application of Section 5 Funding Prohibition to Projects Outside the CBRS that Benefit CBRS Units

CLF agrees with your conclusion that Section 5 of the CBRA prohibits federal financial assistance to any project that serves a CBRS unit, even if the project is located outside the CBRS unit in question. We applaud your recognition that federal financial assistance to such projects is inconsistent with the purposes of the CBRA, since they subsidize the very sort of coastal barrier development that the CBRA seeks to discourage.

C. Deletion of the "Essential Link" Language of Section 6(a)(3)

CLF supports the proposed recommendation to eliminate the loophole provided by Section 6(a)(3) of the CBRA. We agree that Section 6(a)(6)(F) better protects the interests of the CBRA by restricting the repair, replacement, or reconstruction of roads and other public facilities within the CBRS to projects that are consistent with the conservation purposes of the CBRA.

D. Restrictions on Dredged Material Disposal

CLF also supports the proposed recommendation to amend Section 6(a)(2) of the CBRA to require that dredged material disposal within the CBRS be consistent with the conservation goals of the CBRA. The amendment would close another potential loophole.

E. Deletion of the OMB Certification Requirement of Section 7

While we agree that the Office of Management and Budget is ill-equipped to monitor federal agency compliance with the CBRA

because it lacks the capability to audit agency spending, we do not think that the solution is to eliminate the certification requirement entirely. We suggest that you instead recommend that Congress ask the General Accounting Office, which is able to audit expenditures, to take on the certification task.

Sincerely,

Paul Hauge

Paul Hauge
Staff Scientist

/ph
encl.

cc: Governors and coastal zone management/state planning offices of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut
Congressional delegations of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut
National Wildlife Federation

1051

SIERRA CLUB

GULF COAST REGIONAL CONSERVATION COMMITTEE

OFFICE OF THE VICE-CHAIR
POST OFFICE BOX 176
OCEAN SPRINGS, MS 39564

Coastal Barriers Study Group
ATTN: Mr. Frank McGilvrey
U.S. Dept. of the Interior
National Park Service - 498
Post Office Box 37127
Washington, D.C. 20013-7127

June 19, 1987

RE: Report to Congress: Coastal Barrier Resources System (CBRS)

Dear Mr. McGilvrey:

The Gulf Coast Regional Conservation Committee (GCRCC) of the Sierra Club has reviewed the draft Report to Congress with regard to its impact on the southeastern Atlantic and Gulf states within our region. Please take note of our comments, suggestions, reservations, etc., for the record and the attached resolution that was unanimously adopted by the GCRCC on May 10, 1987, in Washington.

The GCRCC commends the Study Group and its members and staff for their excellent efforts to protect and expand the CBRS, especially in the southeastern United States. The GCRCC affirms and supports the Study Group's recommendations to Congress that the CBRS be expanded to include new units in the Florida Keys, Puerto Rico, and the Virgin Islands. We strongly support the expansion of the CBRS to include wetlands that are associated with and protected by coastal barriers. We also support the inclusion of secondary barriers in large coastal embayments such as Tampa Bay, FL, Mobile Bay, AL, Lake Borgne, LA, Mississippi Sound, MS, and Matarorda Bay, TX. We are pleased that the wetlands of Four-Mile Village (FL unit P31A) are now protected because of the Sierra Club's preserve at that location.

We are, however, very deeply concerned about the Study Group's recommendations that all "otherwise protected coastal barriers" such as National Seashores and National Wildlife Refuges be excluded from the CBRS. While we applaude your recommendation that all privately owned property within those "otherwise protected coastal barriers" be included in the CBRS, we vehemently oppose the concept of two CBRS's: one private and one governmental. Although most federal- and state-protected coastal barriers are preserved in perpetuity as parks, seashores, and wildlife refuges, tax monies can still be squandered on ill-concieved projects that would otherwise be prohibited if those barriers were in the CBRS. We believe that federal and state governments have a responsibility to abide by the same rules and regulations that prohibit development on private property at taxpayers' expense. Structures on those othewise protected barriers should not be reconstructed after hurricane or storm-related losses.

We reaffirm our support for and strongly recommend to the Department of the Interior and Congress that all undeveloped coastal barriers or parts thereof in National Seashores and National Wildlife Refuges in our southeastern region (South Carolina to Texas) be added to the CBRS as soon as possible. Only those specific areas that are required for adminsitrative, regulatory, and/or public access purposes should be excluded provided that tax monies are not used thereon to construct or reconstruct facilities on the shifting sands.

The GCRCC believes that the Study Group was remiss in not recommending the inclusion of coastal barriers along the Pacific Coast and the Great Lakes. Again, the Department's attitude appears to be that what is good for the Atlantic and Gulf coasts is not good for other coasts of the United States. Such a philosophy is not only ridiculous, but unfair to private property owners as well. We respectively and strongly urge that you reconsider that position. If the CBRS is good for environmental and economic reasons along our Atlantic and Gulf coasts, it will surely be good for our "other coasts." We shall urge Congress to protect all of our coastal barrier resources regardless of their locations.

The GCRCC concurs with the Study Group's proposed recommendation that a joint study be conducted by the Department of the Interior, the Department of Defense, the Federal Emergency Management Agency, and the National Oceanic and Atmospheric Administration to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers when those barriers are devistated by major storms or hurricanes. We agree that the policy of replacing damaged or destroyed structures on coastal barriers fails to consider future public risks. The Sierra Club also supports the call for public education with regard to coastal barrier problems as well as those associated with the effects of rising sealevel on coastal barriers.

We thank you for this opportunity to comment on the draft Report to Congress. We trust that you will accept these suggestions, recommendations, etc., in the spirit in which they are intended; that is, to promote the protection of all of our coastal barrier resources regardless of where they are located (all U.S. coastlines) and/or who controls or owns them. If we may be of additional service to you and the Study Group, please do not hesitate to communicate with this office. Until then, the comments, suggestions, etc., are...

Respectfully submitted,

Edwin W. Cake, Jr., Ph.D.
GCRCC Vice-Chair and
Member, National Coastal Committee

EWC:ewc

Attachment: GCRCC Resolution

XC: Senator John Chafee (Mr. Christopher Ford)
Representative Gerry Studds (Mr. Jeff Pike)
Julie Morris, GCRCC Chair
Vivian Newman, National Coastal Committee Chair
Sharon Newsom, National Wildlife Federation

SIERRA CLUB

GULF COAST REGIONAL CONSERVATION COMMITTEE

RESOLUTION

WHEREAS, the U.S. Department of the Interior has issued its draft REPORT TO CONGRESS: COASTAL BARRIER RESOURCES SYSTEM dated March 1987 that includes recommendations for the protection of the following:

1. The undeveloped coastal barriers in the Florida Keys, Puerto Rico, and the Virgin Islands;
2. The associated aquatic habitats (adjacent wetlands, marshes, estuaries, inlets, and nearshore waters) on or adjacent to units within the Coastal Barrier Resources System (CBRS);
3. Secondary barriers (within large, well-defined embayments such as Tampa Bay, FL, and Mississippi Sound, MS);
4. All privately owned property (inholdings) within conservation or recreation areas established by federal, state, or local laws on undeveloped coastal barriers; and
5. All privately owned, undeveloped coastal barriers that are held for conservation purposes; and

WHEREAS, the sphere of influence of the Gulf Coast Regional Conservation Committee of the Sierra Club includes the Florida Keys, Puerto Rico, and the Virgin Islands as well as seven southeastern Atlantic and Gulf Coast States that contain a significant number of the proposed additions to the CBRS; and WHEREAS, the Gulf Coast Regional Conservation Committee has as one of its primary conservation goals the protection of coastal barriers and adjacent wetlands in its region.

NOW, THEREFORE, BE IT RESOLVED,

1. That the Gulf Coast Regional Conservation Committee of the Sierra Club hereby commends the U.S. Department of the Interior and the members and staff of its Coastal Barriers Study Group and especially Mr. Frank McGilvrey for their foresight and continued efforts to protect and expand the Coastal Barrier Resources System;
2. That the GCRCC affirms and supports the recommendations of the Department of the Interior and its Study Group (as outlined in the Executive Summary of the draft REPORT TO CONGRESS) with regard to the inclusion of new units in the Florida Keys, Puerto Rico, and the

2. (continued) Virgin Islands; associated aquatic habitats in all states; secondary barriers in large coastal embayments; all privately owned property within "otherwise protected coastal barriers"; and all privately owned and undeveloped coastal barriers that are helf for conservation purposes;
3. That the GCRCC strongly opposes the Department's recommendation that "otherwise protected coastal barriers" such as National Seashores and National Wildlife Refuges be excluded from the CBRS because such an action will establish a defacto system that is exempt from the congressionally mandated environmental and economic regulations that were designed to prevent unwise coastal barrier developments;
4. That the GCRCC reaffirms its support for and strongly recommends to the Department of the Interior and to Congress that all undeveloped barriers or parts thereof in National Seashores and Wildlife Refuges within the GCRCC region (South Carolina to Texas, Puerto Rico, and the Virgin Islands) be added to the CBRS as soon as possible with the exception of those specified areas that are required for limited administrative, regulatory, or public access purposes;
5. That the GCRCC strongly opposes the Department's recommendation that undeveloped coastal barriers along the Pacific Coast, in Hawaii, and in the Great Lakes be excluded from the CBRS because such action would negate the environmental and economic benefits to the nation;
6. That the GCRCC supports most of the proposed "Conservatio Recommendations" contained in the Executive Summary of the draft REPORT TO CONGRESS that strengthen the Coastal Barrier Resources Act including
   a. The proposal to include all qualifying government properties that are determined to be surplus (e.g., military or Coast Guard properties) in the CBRS prior to their disposal unless they are otherwise exempted under the law; and
   b. The proposed joint study by the Departments of the Interior and Defense, the Federal Emergency Management Agency, and the National Oceanic and Atmospheric Administration to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers following major storms or hurricanes;

AND, BE IT FURTHER RESOLVED,

7. That the GCRCC hereby urges all other entities within the Sierra Club including Chapters, the Regional Vice-President's Forum, the National Coastal Committee, and the National Conservation Department to take all necessary steps and actions to communicate their support of the proposed improvements to the Coastal Barrier Resources Act and System to Congress and to the Coastal Barriers Study Group of the Department of the Interior, National Park Service-498, P. O. Box 37127, Washington, D.C. 20013-7127.

Duly presented and adopted this 10th day of May, 1987, in Washington, D.C.

s/ Julie Morris, GCRCC Chair, and Ed Cake, GCRCC Vice-Chair

1124

ST. LAWRENCE-EASTERN ONTARIO COMMISSION
317 WASHINGTON ST., WATERTOWN, N. Y. 13601-3788
PHONE (315) 785-2460
FRANCIS G. HEALEY, Chairman DANIEL J. PALM, Executive Director

June 23, 1987

Coastal Barriers Study Group
U.S. Dept. of the Interior
National Park Service -498
P.O. Box 37127
Washington, DC 20013-7127

Re: Coastal Barriers Resources System
Great Lakes
Eastern Basin of Lake Ontario

Dear Sirs:

The Commission notes, with regret, that final draft recommendations by the Department of the Interior exclude the Great Lakes from the Coastal Barriers Resourse System. Enclosed correspondence of June 10, 1985 to the NYS Department of State, Coastal Programs Administrator clearly stated this Commission's support for inclusion of area coastal barrier formations with the CBRS.

We urge inclusion of the Great Lakes Basin in the CBRS. Please contact Commission offices should you have any questions about our position in this matter.

Respectfully,

Daniel J. Palm, Ph.D.
Executive Director

cc: George Stafford, DOS
DJP:lb
Enclosure

1158

Lake Michigan Federation
8 South Michigan Avenue Suite 2010
Chicago, Illinois 60603 (312) 263-5550

June 19, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service-498
P.O. Box 37127
Washington, D. C. 20013-7127

Dear Sirs:

In regard to the Department of the Interior's final draft report to Congress on proposed additions to the Coastal Barriers Resources System (CBRS), please be advised that the Lake Michigan Federation strongly urges that all potential units in the Great Lakes be included in the System.

These units are vital to the health of the Great Lakes ecosystem and must not be excluded from Congressional addition to the CBRS. Many of these units are spawning grounds for a variety of Great Lakes wildlife. These spawning grounds and species are already threatened by organic chemicals, heavy metals, excessive nutrient loadings and other pollutants that can endanger healthy breeding for generations. To surrender these invaluable wetlands and shorelines is shortsighted and could very well be an irreversible mistake; the environmental and economic impacts of exluding these units from the System could be disastrous. Effects on the $4 million Great Lakes sports fishing industry, particularly on efforts to restore natural reproduction, would be especially damaging.

Stress on Great Lakes coastal wetlands is also currently exacerbated by unusually high lake levels; preservation of these lands are essential in long-term low-cost efforts to prevent flooding and erosion damage.

Thank you for taking our concerns into consideration. Please call or write if you have further questions or if we can be of assistance.

Sincerely,

Glenda L. Daniel
Executive Director

695

OHIO AUDUBON COUNCIL
ASSOCIATED WITH THE NATIONAL AUDUBON SOCIETY
3776 Wales Ave., NW Massillon, Ohio 44646

June 4, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

To Whom It May Concern,

It has come to our attention that the Department of the Interior has reversed its previous position by deciding that the coastal barriers of the Great Lakes don't deserve protection under the Coastal Barriers Resources Act. This Act was designed to protect islands, beaches, marshes and estuaries from unwise development. Excluding the Great Lakes from the Coastal Resources Barrier System is unacceptable - both from an environmental and an economic perspective.

The coastal areas of the Great Lakes suffer extensively every year as unwise developments continue to destroy valuable wetlands. Wetlands provide important habitat for breeding birds, fish and mammals and are important resting areas for migrating birds. In addition, wetlands provide erosion protection while helping to improve water quality. Furthermore, private citizens suffer millions of dollars of loss as they often unwittingly purchase homes and property in coastal areas that will inevitably suffer from storms and erosion problems. As taxpayers, we end up paying the bill as claims are submitted for flood damage and disaster relief. The problems of unwise development are very serious along the coast in the Great Lakes region.

We know all too well that there are serious flooding and erosion problems on Lake Erie and we are rapidly losing the remaining wetland areas along the lake. The coastlines of Lake Erie and all of the Great Lakes, as well as the coastline along the Pacific Ocean, deserve to be included in the Coastal Resources Barrier System. We support the proposed addition of 1,010,646 new acres to the system, but we also feel very strongly that deleting the Great Lakes from this system is inappropriate and counterproductive.

Sincerely,

Alan R. Dolan
President

883

The Audubon Society of Ohio

Cincinnati O.

1890 Churchwood Drive
Cincinnati, OH 45238
June 15, 1987

Coastal Barriers Study Group
U.S. Department of the Interior, National Park Service
P. O. Box 37127
Washington, D.C. 20013-7127

Ladies and Gentlemen:

The Audubon Society of Ohio protests the decision of the Department of Interior to remove the coastal barriers of the Great Lakes and the Pacific coast from the protection afforded by the Coastal Barriers Resources Act.

We don't understand why such a decision was made.

Certainly the Department of Interior is aware of the serious flooding and erosion problems that Lake Erie and the other Great Lakes have. Certainly the Department of the Interior must be aware of the threat to the wetlands in the areas of the Great Lakes. And certainly the Department of the Interior must know that the same problems exist on the Pacific Coast.

We need to protect our natural resources, and most needing of special care are the coastal islands, the beaches and the wetlands of the nation. In the past we have treated them cavalierly but now must be firmly dedicated to protecting what remains.

I fervently hope that the Department of the Interior will see fit to reaffirm its original position that the coastal barriers of the Great Lakes and the Pacific coast indeed do need the protection of the Coastal Barriers Resources Act.

Sincerely yours,

William H. Bocklage
Conservation Chairman
THE AUDUBON SOCIETY OF OHIO

242

1291

"UNITY is STRENGTH"

OHIO ENVIRONMENTAL COUNCIL

June 22, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
Washington, DC 20013-7127

Dear Reader:

The following are comments and concerns of the Ohio Environmental Council (OEC) regarding proposed additions to the Coastal Barriers Resources System (CBRS).

- The OEC generally supports the inclusion of the five Ohio sites listed in the inventory: Middle Bass Island (OH-05), North Bass Island (OH-06), Bay Point Shoal (OH-08), South of Sandusky (OH-09), and Mentor-on-the-Lake (OH-10).

- The fact that only five sites in Ohio are found in the inventory is itself evidence of the need to protect these (remaining) coastal barrier sites. Recognizing this need, we share a concern of the Ohio Department of Natural Resources regarding the potential loss of federal funds for projects on state owned land in two of the areas (a state nature preserve in the area of South of Sandusky and a state park in the area of Mentor-on-the-Lake). There should be some provision in the CBRS designations to allow continued use of federal monies for environmentally-sound projects on such units.

- With no assurance that Ohio will have coastal zone management legislation in the forseeable future, we have no choice but to rely on the albeit limited protection which would be provided to the five Ohio sites via their inclusion in the CBRS.

- According to rough calculations, only a miniscule portion of United States Great Lakes shoreline is included in the inventory: approximately 3% of the total U.S. Great Lakes shoreline and approximately 2.5% of Ohio's Lake Erie shoreline. The recommendations, even if accepted in entirety would not withdraw a significant amount of land from the market, and, by definition, would not withdraw any developable land.

155 NORTH HIGH STREET, COLUMBUS, OHIO 43215-3094 614-224-4900

Recycled Paper

- Federal revenues should not subsidize environmentally-damaging (and therefore potentially fiscally-unsound) "development" in areas which should not be developed. Including the proposed Great Lakes additions to the CBRS could save federal dollars from being misinvested in development schemes on land that is better left natural. Because CBRS designation does not preclude privately funded development, arguments against expansion of CBRS based on "anti-development interests" are weakened.

Sincerely,

Stephen H. Sedam
Executive Director

cc: Governor Richard Celeste
Richard Bartz, Ohio Department of Natural Resources
Elise Jones, National Wildlife Federation

862

REALTOR®

the Ohio Association of REALTORS®

200 EAST TOWN STREET · COLUMBUS, OHIO 43215 · (614) 228-6675
ARMIN GUGGENHEIM PRESIDENT ALMON R SMITH EXECUTIVE VICE PRESIDENT

June 9, 1987

Department of Interior
Coastal Barrier Study Group
National Park Service
P.O. Box 37127
Washington, D.C. 20012-7127

Dear Sir/Madame:

I am writing to you in my capacity of President of the Ohio Association of REALTORS to voice my support for your draft report concerning the Coastal Barrier Zone Plan.

The Ohio Association of REALTORS fully supports the draft and is pleased to see that Ohio's Great Lakes coastline has been removed from the potential Barrier Zone plan. The economic development of the Great Lakes area is of vital consideration, both at the federal and state level. The revitalization of economically depressed areas along Lake Erie depends on the ability for development to take place along the coastline.

While OAR is sensitive to the erosion problems along our northern boundary, Congressional intent in the Coastal Barrier Resources Act of 1982 was never to include the Great Lakes area. The Great Lakes region is not affected by the same type of heavy water damage, such as hurricanes, as those areas which were originally intended to be a part of the Coastal Barrier Resources System. To include this area in a plan which deals with coastal barrier zones of a different type is not what was expected or needed.

The Ohio Association of REALTORS continues to work at a state level to determine feasible solutions to the erosion problem. While a real problem does exist, the solution does not lie in legislation which cuts off financial aid to an area which was untargeted in the initial study plan.

Again I offer my support for the 1987 draft plan of the Coastal Barrier Study Group.

Yours very truly,

Armin Guggenheim
President

AG/mas

1357

THE LEAGUE OF WOMEN VOTERS OF MICHIGAN

200 MUSEUM DRIVE SUITE 202 LANSING MICHIGAN 48933-1997 (517) 484-5383

June 16 1987

The Honorable Donald Hodel
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Hodel:

The Coastal Barriers Resources Act is making a significant contribution to the protection of our nation's fragile coastal environment, and its impact could be even greater if the Great Lakes, the country's fourth and only freshwater coast, were included in its implementation.

The Great Lakes coast has much in common with its marine counterparts. It is just as vulnerable to erosion, flooding and other impacts of increased water levels. Its dunes and other natural features, including its fisheries and wildlife, are equally sensitive to the effects of development. It is as expensive, if not more so, to protect and maintain infrastructure and other facilities located on this coast as any other because of the extended winter season and ice buildup on the shoreline.

The League of Women Voters of Michigan urges you to reconsider this issue and include the Great Lakes in the department's final report to Congress on the implementation of this act. Even those Great Lakes jurisdictions which opposed this designation in your draft report have come to recognize the wisdom of this action and now support the inclusion of the Great Lakes.

Please give this your most serious consideration as you develop the final report.

Sincerely,

Nancy J. White

Nancy J. White
President

1049

Detroit Audubon Conservation Committee

June 20, 1987

U.S. Department of Interior
National Park Service-498
P.O. Box 37127
Washington, DC 20013-7127

Coastal Barriers Study Group:

Regarding the final draft report for expanding the Coastal Barriers Resources System, the Detroit Audubon Conservation Committee offers the following comments:

We fully support the proposed addition of 1,010,646 new acres to the System.

We strongly urge you to include the Great Lakes as part of the System. We understand that the Great Lakes were included in the initial draft report but were later dropped.

Great Lakes coastal barriers are irreplaceable resources which deserve protection from future development. These barriers protect vital habitat for birds, fish, and other wildlife while providing excellent undeveloped recreational opportunities. They also serve as a buffer against flooding and erosion, a major problem in Michigan.

In addition, we urge you to include the Pacific coast as part of the System, and we oppose removing military and Coast Guard lands from the System.

Thank you,

Grant Ruttinger
Chairman, DAS Conservation Committee
14960 Fairmount
Detroit, MI 48205

1174

THE NATURE CONSERVANCY
MINNESOTA CHAPTER

1313 5th Street SE Minneapolis, Minnesota 55414-1524 (612) 379-2134

June 16, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
Washington, D.C. 20013-7127

To whom it may concern:

The Minnesota Chapter of The Nature Conservancy is concerned about the Great Lakes having been dropped from the Coastal Barrier Resource Act.

There are many unique areas along the Great Lakes which harbor ecologically significant sites. For example, Minnesota Point in Duluth is an outstanding dune complex which provides habitat for several state endangered plants and animals.

If you need data, the Minnesota Natural Heritage Program, housed in the Minnesota Department of Natural Resources, can provide it for you. Barbara Coffin, the Heritage Program coordinator can be reached either by calling (612) 296-4264 or writing MN Natural Heritage Program, Box 7, 500 Lafayette Road, St. Paul, MN 55146.

I hope you will reconsider your decision to drop the Great Lakes from protection under the Coastal Barrier Resource Act.

Sincerely,

Margaret A. Kohring

Margaret A. Kohring
Executive Director

MAK:sf

National Office 1800 North Kent Street Arlington, Virginia 22209

245

1317

Save the Dunes Council

ORGANIZED IN 1952

P.O. BOX 114 • BEVERLY SHORES, INDIANA 46301 • TELEPHONE 219/879-3937 OR 926-2224

June 23, 1987

Coastal Barriers Study Group
United States Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Coastal Barriers Study Group Members:

The Save the Dunes Council urges the Study Group to seriously reconsider its exclusion of the Great Lakes shoreline from its recommendations for additions to the coastal barriers system. Recent high lake levels have underscored the need for treating the undeveloped shorelines of the Great Lakes as a zone where change is the norm and unpredictability the constant.

More specifically, the Save the Dunes Council recommends that the Study Group include the undeveloped portions of Indiana's Lake Michigan shoreline in recommendations for additions to the coastal barriers system.

The enclosed map, a map of the boundaries of the Indiana Dunes National Lakeshore and its environs, contains virtually all of the undeveloped portions of Indiana's eligible shoreline. Rising lake levels, as noted above, have produced demands for federal assistance in protecting shoreline properties without producing demands for a halt to development along or near the shoreline. Preserving the undeveloped shoreline, whether public or private, as the lakeshore equivalent of a floodplain could prevent large infrastructure investments that could attract new development, which in combination would in the future be used to justify requests for federal help to protect them from erosion.

Indiana has a total of 45 miles of shoreline along Lake Michigan. Approximately half is "hardened," generally supporting industrial uses on riparian fill. Of the remaining shoreline, approximately 23 miles, 13 are included in the boundaries of the Indiana Dunes National Lakeshore. However, not all are in federal ownership, and even some of the federally owned shoreline has been hardened as a protection against erosion. The hardening of the shoreline in the public and residentially used portions has been the result of man-made interruptions of the shoreline, which cause accretion on the updrift side (areas 1, 6 and 12 on the enclosed map) and severe erosion on the downdrift side (areas 4, 5, and 11).

The marked areas on the enclosed map are in large part eligible for inclusion in the system, in the Council's opinion. The green corner on area 1 is that part of the beachfront included in the Lakeshore boundaries that is actually part of Marquette Park, owned by the city of Gary. All of area 2 is Gary city property, with the westernmost being the balance of Marquette Park, and the easternmost being city-owned shoreline in front of a developed residential area. Area 3 is the Lakeshore's West Beach Area. Area 4 is also within Lakeshore boundaries, but is the town beach for the town of Ogden Dunes, and is now experiencing a hardening by individual homeowners because of being in the erosion zone caused by the Port of Indiana structures to the east. Area 5 is Lakeshore property, but is also suffering erosion from the Port of Indiana. Area 6 is within Lakeshore boundaries, while areas 7 and 8 are shorelines belonging to the adjacent towns of Dune Acres and Porter, and are included within the Lakeshore boundaries as well. In the case of Area 8, the National Park Service has acquired a walking easement across the shoreline. Area 9, also within Lakeshore boundaries, is owned by and managed by the State of Indiana (as the Indiana Dunes State Park). Areas 10 and 11, the lakefront of Beverly Shores, is all within the Lakeshore boundaries, is owned mostly by the federal government, but includes several town beaches. It also contains a stone revetment installed in 1973 to protect the dunes(!) and the town road from the high lake levels experienced then. The erosion problems here which are (not so slowly) moving westward are the direct result of the harbor structures at Michigan City which constitute a total barrier to the littoral drift. Area 12, a zone of accretion, includes the Michigan City lakefront park, Washington Park, and a small section of undeveloped shoreline frontage east of the park.

We recommend that the entire stretch be evaluated and hopefully included for addition to the coastal barriers system.

Sincerely,

Charlotte J. Read
Executive Director
SAVE THE DUNES COUNCIL

encl: Indiana Dunes National Lakeshore boundary map, December 1986

582

The Naturist Society

P.O. BOX 132, OSHKOSH, WI 54902, USA

Coastal Barriers Study Group
US Dept. of Interior
National Park Service-498
POB 32127
Washington, DC 20013-7127

Regarding the Draft Report on the Coastal Barrier Resources Act

Comment Period Closing June 23

Comment by the Advisory Board of The Naturist Society is as follows:

- We support the addition to the CBRS which has been proposed - 1,010,646 acres.

- We further urge that the Great Lakes and Pacific coasts be included in the plan. We can tell you, from our catbird's perch here in Wisconsin, that the waves of Lake Michigan batter the coast as fiercely at times as the Atlantic Coast littoral is battered.

- We additionally oppose deletion of the military and coast guard lands and federal roads from the system.

Thank you for the opportunity to comment,

Sincerely

Lee Baxandall
President, The Naturist Society

May 22 1987

The Naturist Soc. Inc. is a corporation organized to educate and to promote clothes optional lifestyles and recreational and living spaces

1030

Presque Isle Audubon Society
P. O. Box 1763
Erie, Pa. 16507

June 19, 1987

The Honorable Donald P. Hodel
Secretary of the Interior
U.S. Department of the Interior
National Park Service-498
P.O. Box 37127
Washington, DC 20013-7127

Dear Sir:

The Presque Isle Audubon Society as an individual organization and as a representative of the Erie County Environmental Coalition wishes to address you on the expansion of the Coastal Barrier Resources Act.

We support your recommendations to expand the definition of a "coastal barrier" and to include all aquatic habitats within the barrier system. However, we believe that the deletion of military and Coast Guard lands from the system is counter-productive to the intent of the Coastal Barrier Resources Act.

We appreciate your efforts to clarify the federal funding guidelines and prohibitions and we ask for a continuing program of certification of federal agencies but under the aegis of the General Accounting Office.

We ask that in the Interior Department's recommendations to Congress be included the Great Lakes and the Pacific coasts as originally proposed as well as the "otherwise protected" areas such as federal, state, and local parks and refuges. Inclusion of the Great Lakes shoreline in the system is essential. The current high water levels are causing serious erosion and flooding problems which have resulted in millions of dollars of damages to shoreline residents and taxpayers. Further development of these coastal areas will only increase the extent of the problem.

Our immediate location on Lake Erie includes a large sandspit barrier (Presque Isle) and the resultant bay. This area provides important habitat for a diversity of the fish and wildlife including federal and state listed endangered species. We urge you to include the PA-01 unit of the Great Lakes Basin in the Coastal Barrier Resources Act.

We would appreciate your comments on this proposal.

Thank you for your consideration.

Sincerely,
Ruth E. Swaney
Ruth E. Swaney
230 Lincoln Avenue
Erie, PA 16505

RAS:rmm

905

LEAGUE OF WOMEN VOTERS OF LARCHMONT
LARCHMONT, NEW YORK 10538

June 15,1987

Coastal Barriers Study Group
U.S. Dept. of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Sirs;

We are writing on behalf of the nearly 300 members of the Larchmont League of Women Voters. We herewith submit our comments on the suggested enlargement of the Coastal Barrier Resources Act and the suggested deletions from the existing System.

We support the proposed expansion of the System, including
- addition to existing units,
- new areas such as the Florida Keys, Puerto Rico, the U.S. Virgin Islands, Maryland, New Jersey, secondary barriers in embayments, private inholdings in already protected areas, and all associated aquatic habitats,
- the clarification and strengthening of federal funding guidelines and restrictions.

We also support the inclusion of the Great Lakes and the Pacific Coast in the System.

We strongly oppose any deletions from the System, especially
- deletion of military and Coast Guard lands,
- deletion of the OEM certification of no federal spending,
- and deletion of the Mobile Point unit in Alabama.

This is a valuable opportunity to help lower the federal deficit by spending fewer taxpayer dollars subsidizing unsound coastal development, and at the same time protecting more of our important coastal resources.

Sincerely yours,
Betsy Jacobson
Betsy Jacobson, President
Margaret Strauss
Margaret Strauss, Natural Resources Chair

c.c. Gov. Mario Cuomo
George Stafford, Coastal Prog Manager, N.Y. Dept. State
Sen. Alfonse D'Amato
Sen. Daniel P. Moynihan
Hon. Joseph J. DioGuardi

1030

609

WHIDBEY AUDUBON SOCIETY
Post Office Box 1012
Oak Harbor, WA 98277

May 25, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Study Group:

The final draft of the Coastal Barrier Resources ACT (CBRA) has omitted any coverage of Pacific coast resources. Our Whidbey Audubon Society chapter wants to go on record that such omission is denial of equal benefit of federal services, and is failure to provide timely protection in avoiding future problems. True, development on the Pacific coast does not match that occurring in the East and has not reached a supercritical need for action, but that means that now is the time to plan and to protect against supercritical problem occurrence.

Specifically, twelve sites on Whidbey Island were listed and charted in the U.S. Department of Interior 1985 Coastal Barrier Inventory draft. Those sites are WA 30, 31, 32, 33, 34, 35, 36, 39, 40, 41, 42 and 43. Briefly, about 25% concern military installations, 25% concern locations at or adjacent to state parks, 15% are already developed and 35% are essentially undeveloped. In our judgement all of these locations, except the 15% already developed should be strong candidates for coastal barrier resources protection. Land that is identified as military reservation should certainly not be excluded from protection as such land can very readily be returned to state, municipality or private ownership. There is no assurance as to what the future holds.

Sincerely,

A.M. Arnold
Chapter President

cc: U.S. Senator Daniel Evans
U.S. Senator Brock Adams
U.S. Rep. Al Swift
Governor Booth Gardner
Rod Mack, Washington State Dept. of Ecology
Elise Jones, National Wildlife Federation
Pam Crocker-Davis, Director Washington Office,
National Audubon Society, Olympia, WA

1309

Willapa Hills Audubon Society

P. O. Box 93 - Longview, WA 98632

June 10, 1987

Coastal Barriers Study Group
U.S. Department of Interior
National Park Service-498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Members:

Our chapter was disappointed to learn that sensitive Pacific coast areas have been dropped from the March draft report sent by the Interior Department to Congress, even though they were included in the 1985 inventory for protection under the Coastal Barrier Resources Act.

Among the 73 Washington areas which had been designated, the one of particular interest to our group is the North Beach Peninsula in Pacific County. Bounded by the Pacific Ocean and Willapa Bay, this unit is particularly rich in wildlife. Our annual Christmas Bird Count in December tallied 109 different species in this bit of southwest Washington. The peninsula, which is open to storms sweeping in from the Pacific, also serves as protection to Willapa Bay, with its famous oyster industry.

The 1985 inventory included many other West Coast beaches, dunes, and river mouths equally deserving of protection from federally supported development. Owing to the prevailing wind flow, severe winter storms arrive from the west, and these proposed coastal barriers take the first force, contributing to erosion and making development expensive both in initial cost and in later claims for Federal disaster assistance.

Our members hope that you will reconsider this action and will restore to the Pacific Coast the same protection enjoyed by the Atlantic Coast.

Yours truly,

Mary Hoffman-Nelson, President,
Willapa Hills Audubon Society

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1000 FRIENDS OF OREGON

1409

June 23, 1987

Mr. Don Hodel, Secretary
Department of Interior
National Park Service - 498
Box 37127
Washington, D.C. 20013

Subject: DOI Recommendation to Congress for Expansion of the Coastal Barrier Resources System

Dear Mr. Hodel,

1000 Friends of Oregon supports the inclusion of certain Oregon coastal barriers in the national Coastal Barrier Resources System. To our disappointment, DOI does not recommend the addition of any areas in Oregon to the Coastal Barrier Resources System (April, 1987 DOI Report to Congress).

Our position regarding the designation of Oregon coastal barriers under the Coastal Barrier Act is described in our September 25, 1985 letter to your agency (letter attached). We believe that the coastal barriers program can reinforce Oregon's efforts to control development in hazardous areas and to protect significant wildlife habitat.

At the same time, we see no reason why properly designated coastal barriers in Oregon will conflict with economic development and recovery plans for coastal communities. Of the 34 sites included in DOI's 1985 inventory of Oregon coastal barriers, only a small number include land designated for development in local comprehensive plans. We recommended boundary revisions to exclude from coastal barrier status those lands designated for development (portions of Nehalem Spit and Bay, Sand Lake, Chapman Beach, Siletz Spit). Further refinements are necessary to ensure that coastal barrier designation do not conflict with state-approved development actions, but we believe these refinements are well within grasp.

300 WILLAMETTE BUILDING 534 S.W. THIRD AVENUE PORTLAND, OREGON 97204

In summary, we urge DOI to include Oregon coastal barriers in its recommendations to Congress for an expanded Coastal Barrier Resources System.

Sincerely,

Paul Ketcham
Senior Planner

cc: Governor Neil Goldschmidt

SIERRA CLUB
CALIFORNIA

6014 COLLEGE AVENUE, OAKLAND, CALIFORNIA 94618 (415) 658-7106

1252

Rod Holmgren
3396 Taylor Road
Carmel, CA 93923

May 5, 1987

Coastal Barriers Study Group
National Park Service
U. S. Department of Interior
P. O. Box 37127
Washington, D. C. 20013-7127

Dear Friends,

We have read with interest your draft "Report to Congress, Coastal Barriers Resource System."

We were surprised to see that the Report ignores the comments made by many of us regarding the DOI's own recommendation for addition of 56 undeveloped beaches and spits in Northern California to the Coastal Barriers Resources System. Indeed, there is nothing in the Report responding to the many comments about the DOI's own recommendations for additions to the CBRS along the entire Pacific Coast, Alaska, the Great Lakes and the Territories.

During the comment period in the spring and summer of 1985, you received comprehensive comments from many Sierra Club leaders and other environmentalists. Generally, the Sierra Club comments supported DOI's proposals for California additions and many other proposals based on a total ecosystem approach to the definition of "coastal barriers."

In my comment, dated September 12, 1985, I called attention to the fact that of 56 units proposed for DOI for addition along California's coast, 35 are located in the northern and central counties - Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz and Monterey. These units would embrace more than 63 shoreline miles of the 95 mile total proposed for the entire length of California, and their acreage would total 36,046 of the 48,445 proposed for this state.

We specifically supported the addition of all 35 units in northern and central California, listing them by name and submitting maps to make sure the identification was clear and accurate. We proposed a number of additional units in the northern half of the state, with supporting evidence and maps. We called attention to the fact that these units fall within the First, Sixth, Eleventh and Sixteenth Congressional Districts of California.

We also specifically urged DOI and the Congress to broaden the definition of "coastal barriers"; to include the coasts of the Great Lakes, Pacific states and territories; to include areas that are already protected, such as the national seashores and state beach parks; and to oppose deletion of any areas from the existing system.

We note that your draft fails to respond to most of these comments. We surely support your recommendation to add all aquatic habitats associated with coastal barriers now in CBRS, as well as those along the Gulf of Mexico and Atlantic coasts that are proposed for addition to CBRS.

We expect that members of our Club's National Coastal Committee who live in Atlantic and Gulf Coast states, as well as the Great Lakes area, will comment in detail on your draft recommendations, including those regarding adjustments to boundaries and deletions of areas now included in the CBRS.

We are still in strong support of CBRA's prohibition against Federal subsidies of development on barriers in the System. We are, of course, strongly against taxpayer subsidies that result in damage to marshes, fisheries or wildlife habitat. We need not remind you that because the barrier islands are extremely unstable, they are unsuitable for development.

Sincerely,

Rod Holmgren

Rod Holmgren, Chair
Coastal Committee of the
Northern California
Regional Conservation Committee

cc: Rep. Douglas Bosco
Rep. Barbara Boxer
Rep. Tom Lanton
Rep. Leon Panetta
Frank McGilvrey
Vivian Newman
Michele Perrault
Gil Davis
Bob Hattoy
Ron Guenther
Jane Preskienis
Tim Duff
Hal Levin
Janie Figen

573

ECOLOGY CENTER
OF SOUTHERN CALIFORNIA
P.O. BOX 35473, LOS ANGELES, CA 90035 • TELEPHONE 213/559-9160

May 23, 1987

Coastal Barriers Study Group
U.S. Department of Interior
National Park Service-498
P.O. Box 37127
Washington, D.C., 20013-7127

Dear Study Group Members,

The statewide members of the Ecology Center of Southern California applaud your efforts to save our shores, and we urge you to support the proposed addition of 1,010,646 new acres in the Coastal Barrier Resources System.

This includes areas in the Florida Keys, the U.S. Virgin Islands, Puerto Rico, Maryland, New Jersey, large embayments, and adjacent aquatic habitat. We also urge the inclusion of the Great Lakes and the Pacific coast in the System.

We are opposing the deletion of military and Coast Guard lands from the Coastal Barrier Resources System.

Thank you for your efforts to preserve the shores of the American public.

Sincerely,

Anna Harlowe

Anna Harlowe
Issues coordinator
Ecology Center of Southern California

251

74

SIERRA CLUB - REDWOOD CHAPTER

~~P. O. Box 466, Santa Rosa, Ca. 95402~~

SIERRA CLUB - REDWOOD CHAPTER
CONSERVATION COMMITTEE
Ron Guenther
29900 Highway 20
Fort Bragg, California 95437

April 23, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Gentlemen:

We were disappointed to learn that the Interior Department has decided that the coastal barriers of the Pacific Coast do not warrant protection from development. We strongly disagree.

Our coastal barriers on the Pacific Coast buffer the mainland from storm waves and erosion, and in so doing, protect some of our most productive ecosystems such as marshes, estuaries, and other aquatic habitats. Our fishing and tourist industries, especially, are heavily dependent on such protection. Development of our coastal barriers and their nearby wetlands will, and has caused serious environmental harm.

We have these recommendations:

1) That the Pacific Coast be included in the Coastal Barrier Resources System (CBRS);

2) That the Great Lakes be included in the CBRS;

3) That the 1,010,646-acre Interior proposal for new inclusions in the CBRS be adopted in its entirety;

4) That military and Coast Guard lands and federal roads be included in the CBRS.

Please keep us informed.

Ron Guenther
Conservation Chair
For the Sierra Club - Redwood Chapter

. To explore, enjoy and preserve the nation's forests, waters, wildlife, and wilderness . .

725

SIERRA CLUB ~ SANTA LUCIA CHAPTER
738 Higuera St., Suite H, San Luis Obispo, CA 93401

June 3, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service-498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Dear Sirs;

The Sierra Club, Santa Lucia Chapter, recommends that the West Coast areas be included in the final report to Congress on the Coastal Barrier Resources System (CBRS). These units have the same protective function and encompass similar fragile natural resources as those along the Gulf and Atlantic Coasts. Also, these West Coast areas face great potential for development pressures where underwriting projects with federal tax dollars would be unsound.

Specifically, units CA-36 (San Simeon), CA-37 (Morro Bay), and CA-38 (Santa Maria), deserve to be included in the CBRS inventory. The San Simeon unit protects a significant stream/ocean lagoon, with a rich listing of wildlife, including anadramous fish runs. The Morro Bay unit represents the greatest estuary on the West Coast between Monterey County and Orange County. Morro Bay is a major resource for fish spawning, migratory birds, and several endangered species. The Santa Maria unit represents an undeveloped beach protecting the mouth of the Santa Maria River and its associated wetlands. It is part of the Nipomo Dunes, a National Natural Landmark.

It should be noted that units CA-36 and CA-37 are incorrectly listed as being in Congressional District #20. Actually, they are in Congressional District #16, Mr. Leon Panetta.

It is time to stop the waste of federal tax dollars that support projects in fragile coastal areas such as the three units specifically cited above. The Chapter urges your agency to include these units, along with the rest of the West coast inventory, into the CBRS program.

Sincerely,

Frank Bush

Frank Bush, Chair
Conservation Committee
Santa Lucia Chapter, Sierra Club

C: Governor Deukmejian
California Coastal Commission
Congressman Panetta
Congressman Thomas
Senator Wilson
Senator Cranston

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252

941

THE CALIFORNIA NATIVE PLANT SOCIETY
DEDICATED TO THE PRESERVATION OF CALIFORNIA NATIVE FLORA

Box 381
Carmel Valley
Calif. 93924
June 15, 1987

Coastal Barrier Study Group
Department of the Interior
P. O. Box 37127
Washington, D. C. 20013

Gentlemen:

The Monterey Bay Chapter of the California Native Plant Society was very disappointed to learn that the Interior Department has decided not to ask Congress to protect any areas of the West Coast under the Coastal Barrier Resources System. It was our understanding that inclusion in this system would not stop development, but would prohibit Federal subsidies of unwise development.

Our organization has been working for many years to prevent overdevelopment of the fragile coastal areas around Monterey Bay, particularly the beaches and sand dunes that function much like barrier islands in absorbing the intensity of winter storms and preventing damage to inland agricultural and developed areas. Recent studies show that construction in the dunes and near the beach intensifies erosion and accelerates the destruction of one of our state's most fragile and threatened natural communities. In addition, studies released only this year project increasing erosion because of the rising sea level. Under these circumstances we continue to recommend that sand dunes should be considered analagous to barrier islands in deserving protection from Federal policies subsidizing development.

We would like to express support for the positive recommendations in the current proposal, including expansion of the definition to include other landforms that function as coastal barriers and the addition to the system of such areas in Florida, Puerto Rico and the U.S. Virgin Islands, Maryland, New Jersey, and other areas. We also would like to urge that the deleted areas in existing units and on military land be reinstated; tax dollars are being wasted in these areas as well. For example, not long ago Fort Ord spent over $500,000 on riprap to protect the Soldier's Club; but recently the Army announced that it is giving up the effort and will abandon the building to the forces of erosion.

We urge you to reconsider your proposal to eliminate the Pacific Coast and Great Lakes areas from an expanded Coastal Barrier Resources System. A rational system would include all those areas where tax dollars are currently subsidizing destruction of priceless "coastal barriers."

Sincerely yours,

Mary Ann Matthews
Conservation Chairman
Monterey Bay Chapter CNPS

cc Senator Alan Cranston
Senator Pete Wilson
Rep. Leon Panetta

983

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JOEL SINGER
Vice President
Planning, Research & Economics

June 16, 1987

Department of Interior
Coastal Barrier Study Group
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127

To Whom It May Concern:

The purpose of this letter is to formally state our support for the Department of Interior's revised draft report to Congress on the expansion of the Coastal Barrier Resources System issued March 23, 1987.

In that draft report, it was recommended that the coastal region along the Pacific Coast of California not be included in the Coastal Barrier Resources System at this time. The Department of Interior's report suggests that "additional study and consideration is necessary before a recommendation can be made regarding undeveloped coastal barriers along the Pacific Coast, Great Lakes, Alaska, Hawaii, and American Samoa."

The report indicated that "Congress did not address the possibility of including barriers on coastlines other than the Atlantic Ocean and Gulf of Mexico in 1982." Coastal lands on the West Coast are, for the most part, not subjected to the same types of environmental assaults as experienced along the Atlantic and Gulf of Mexico coasts, for example, hurricanes, tidal waves and other weather related phenomena. To include Pacific Coast areas in the Coastal Barrier Resources System would inappropriately extend the 1982 legislation to a region having fewer environmentally sensitive characteristics. In this context, the potential squandering of scarce federal resources (such as flood insurance, disaster relief, federal loan guarantees, sewage treatment grants and highway construction funds) which gave rise to the original legislation, is not at issue here.

Further, and perhaps most important, in California, we already have two layers of coastal protection mechanisms in place. Development of the coast is significantly controlled by the State Coastal Commission. Goals and policies governing coastal development are further regulated by locally adopted local coastal plans.

Economic development along the coast is already significantly controlled and congressional efforts to further hamper private investment by withdrawing all forms of federal support would represent an overkill strategy and jeopardize the economic well-being of many communities.

To this end, given the distinct difference between Pacific Coastal areas and the areas bordering the south and southeast coast of the United States we support your exclusion of California lands from the Coastal Barriers Resources System and will monitor Congressional deliberations in the fall of this year to ensure that California lands remain exempted.

Sincerely,

Jack Paulson, President
California Association of REALTORS®

cc: William Moore, President
National Association of REALTORS®

William D. North, Executive Vice President
National Association of REALTORS®

David Weiss, Director,
Energy, Environment & Development, N.A.R.

1288

June 26, 1987

Department of the Interior
Coastal Barrier Study Group
National Park Service
P. O. Box 37127
Washington, D.C.
20013-7127

To Whom It May Concern:

The purpose of this letter is to formally state our support for the Department of Interior's revised draft report to Congress on the expansion of the Coastal Barrier Resources System issued March 23, 1987.

In that draft report, it was recommended that the coastal region along the Pacific Coast of California not be included in the Coastal Barrier Resources System at this time. The Department of Interior's report suggests that "additional study and consideration is necessary before a recommendation can be made regarding undeveloped coastal barriers along the Pacific Coast, Great Lakes, Alaska, Hawaii, and American Samoa".

The report indicated that "Congress did not address the possibility of including barriers on coastlines other than the Atlantic Ocean and Gulf of Mexico in 1982". Coastal lands on the West Coast are, for the most part, not subjected to the same types of environmental assaults as experienced along the Atlantic and Gulf of Mexico coasts, for example, hurricanes, tidal waves and other weather related phenomena. To include Pacific Coast areas in the Coastal Barrier Resources System would inappropriately extend the 1982 legislation to a region having fewer environmentally sensitive characteristics. In this context, the potential squandering of scarce federal resources (such as flood insurance, disaster relief, federal loan guarantees, sewage treatment grants and highway construction funds) which gave rise to the original legislation, is not at issue here.

Further, and perhaps most important, in California, we already have two layers of coastal protection mechanisms in place. Development of the coast is significantly controlled by the State Coastal Commission. Goals and policies governing coastal development are further regulated by locally adopted local coastal plans.

SANTA BARBARA
BOARD OF REALTORS
1415 Chapala Street
P.O. Box 90359
Santa Barbara, California 93190-0359
(805) 963-3787

Economic development along the coast is already significantly controlled and congressional efforts to further hamper private investment by withdrawing all forms of federal support would represent an overkill strategy and jeopardize the economic well-being of many communities.

To this end, given the distinct difference between Pacific Coastal areas and the areas bordering the south and southeast coast of the United States, we support your exclusion of California lands from the Coastal Barriers Resources System and will monitor Congressional deliberations in the fall of this year to ensure that California lands remain exempted.

Sincerely,

SANTA BARBARA BOARD OF REALTORS

Patricia J. Tumnicliffe, President

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BOARD OF REALTORS
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Santa Barbara, California 93190-0359
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CALIFORNIA
Marine Affairs and Navigation Conference

733

June 2, 1987

Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

Gentlemen:

The California Marine Affairs and Navigation Conference, is an organization representing California's ports and harbors and related private interests. This organization, the Governor of California, and many local jurisdictions in California have all opposed expansion of the Coastal Barriers Act to the Pacific Coast.

We are very pleased to see the Secretary of the Interior's recommendations do not include expanding the act to the Pacific Coast. We fully endorse and support the Secretary's recommendation.

Many existing federal and state acts provide sufficient control to ensure protection of valuable natural resources along the California shoreline. Your recommendation to not extend the Coastal Barriers Act to the Pacific Coast will assure that we are not faced with another layer of unnecessary bureaucratic review.

Very truly yours,

Eric Bourdon, Chairman
Legislative Committee

EB:gw
cc: Paul Hughey
Board of Directors

64

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

Department of City and Regional Planning
The University of North Carolina at Chapel Hill
New East Building 033 A
Chapel Hill, N.C. 27514

April 22, 1987

The Coastal Barriers Study Group
Department of the Interior
National Park Service
P.O. Box 37127
Washington, DC 20013-7127

Dear Sirs: Re: March 1987 Draft

This letter responds to your request for comments on the draft Executive Summary of the Report to Congress: Coastal Barrier Resources System.

The draft Report raises a number of important issues and offers various estimates in support of its interpretation of problems and proposed actions.

The draft Report falls far short in one important respect, however. It fails to document the actual status of coastal barrier development that has taken place since enactment of the original CBRA restrictions. Such documentation would not be excessively difficult to compile. Aerial photography comparisons could provide data on the number and extent of development changes. Followup requests to local tax assessors could provide data on the assessed valuation of this post-CBRA development. Infrastructure changes and permit information also could be compiled from government sources. The result would be solid evidence as to the actual, versus the supposed, impacts of CBRA.

Without such evidence, the proposals of the draft Report rest largely on opinions. With such evidence, the proposals could enjoy much greater credibility.

CBRA was a bold experiment. Like any such venture, its premises must be tested against its results. My original study in 1984 (Impacts of the Coastal Barrier Resources Act, NOAA, Washington, DC) was hindered because the CBRA restrictions were too recent to have had much demonstrable effect. Now that five years have elapsed since CBRA enactment, the picture should be clearer.

I find it surprising that DOI has not chosen to document CBRA impacts prior to proposing changes. Perhaps if such documentation were available, the scope and nature of proposed 1987 Draft actions would not be so limited.

Sincerely,

David R. Goodschalk
Professor

DRG/bic

686

The University of Akron

Department of Geology
Akron, OH 44325
(216) 375-7630

June 4, 1987

Coastal Barriers Study Group
U.S. Department of the Interior
National Park Service - 498
P. O. Box 37127
Washington, D.C. 20013

Dear Coastal Barriers Study Group:

I am a coastal geologist who is deeply concerned about the destruction of coastal barriers because of their importance to the biological and physical processes and settings in the coastal zone. I think that any policy that leads to the development/destruction of our already greatly reduced barrier systems is environmentally and ecologically unsound. I encourage you to promote legislation to protect the barriers an all our coasts including those of the Great Lakes.

Sincerely yours,

Charles H. Carter

Charles H. Carter
Associate Professor

CHC:cgh

cc. Representative Tom Sawyer
Governor Richard Celeste

1113

June 20, 1987

Coastal Barriers Study Group
U.S. Department of Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Friends:

This letter contains my comments and recommendations in response to the final draft report submitted to Congress pursuant to the Coastal Barrier Resources Act. Please consider my input and include this letter in the appropriate public record.

At the outset, I strongly support the recommendations to expand the Coastal Barrier Resources System (CBRS). In particular, I support the additions to existing CBRS units; inclusion of new CBRS units (such as the Florida Keys, Puerto Rico, the U.S. Virgin Islands, Maryland, New Jersey, secondary barriers in embayments, and private inholdings in already protected areas); and the inclusion of all associated aquatic habitats within CBRS units. I also support the clarification and strengthening of the federal funding guidelines and restrictions.

I understand that private developers may be organizing opposition to the inclusion of Vero Beach and the Keys in Florida, and Boca Chica and Bolivar Peninsula in Texas. I support the inclusion of these new CBRS units, because they are reasonable and necessary. I hope the Interior Department will uphold its commendable recommendations to include these areas.

Unfortunately, I oppose several of the final draft report's recommendations, including those to delete existing CBRS lands. I am especially appalled at the recommendations to delete military and Coast Guard lands, and to delete the Mobile Point unit in Alabama. I understand that the military deletion recommendation arose from a conflict over funding for an officers' club on the Onslow Beach unit in North Carolina. The Defense Department insists that all defense spending is "essential to national security," even with respect to beach clubhouses. I disagree. I believe that Congress intended to stop foolish development on dangerous or unstable barrier units, whether through private developer or military folly. I recommend that all military and Coast Guard lands be retained within the CBRS, because these lands are deserving of inclusion, and because taxpayers will benefit.

The proposed deletion of the Mobile Point unit in Alabama would establish an egregious precedent, and could reward those attempting to undermine the Act's basic intent. The U.S. Capitol Gulf

257

Shores developed this unit after its October 1982 designation within the CBRS. Through this development and associated political pressure, U.S. Capitol Gulf Shores hopes to delete this unwise development. Congress and the Interior Department should not accede to this ridiculous strategy. If developing a CBRS unit leads to its deletion from the System, then there is no realistic incentive to leave fragile coastal lands undeveloped. This strategy could "erode" the basic integrity of the Act and spark renewed development on coastal barriers, despite the public safety risks, serious environmental impacts, and taxpayer subsidies.

I am most disappointed with the final draft report's failure to include the inventoried Pacific Coast and Great Lakes units within the CBRS. This failure is the single greatest flaw in the report. Coastal barriers and associated aquatic habitats along the Pacific and Great Lakes coasts serve the same protective functions for the mainland; are equally vulnerable to storms and erosion damage; and are subject to similar development pressures as those CBRS units along the Atlantic and Gulf coasts. I do not follow the report's logic in attempting to distinguish between these comparable units. For example, here in California severe winter storms batter the Pacific coastline and often cause serious property damage, and occasional human injury or death. There is also serious wave damage and related erosion along portions of the California coastline. The Act's purposes of encouraging public safety; protecting important environmental values; and reducing taxpayer subsidies could all be served by the inclusion of the inventoried California CBRS units. I recommend that Congress and the Interior Department include the inventoried California CBRS units within the System, along with the other Pacific and Great Lakes units.

In conclusion, please support and uphold the strengthening recommendations in the draft final report, decide to further strengthen the report by including the Pacific and Great Lakes units (and by not deleting the military, Coast Guard, and Mobile Point units).

Thank you very much for considering my views.

Sincerely,

Richard Spotts

5604 Rosedale Way
Sacramento, CA 95822

cc: The Honorable Donald Hodel
Senator Alan Cranston
Senator Pete Wilson
Congressman Robert Matsui
Governor George Deukmejian
California Coastal Commission
Interested parties

361

Attention Coastal Barriers Study Group:

Being a member of the National Wildlife Federation, I am kept up on recent and current events concerning our environment, and it has been brought to my attention that the Department of Interior has released a final draft report as of March 23, 1987 which excludes the Great Lakes and the Pacific coastal regions from the Coastal Barrier Resources System.

I am in support of the proposed addition of 1,010,646 new acres to this System and wish to urge the Interior to rethink the decision.

The Great Lakes, Pacific region, Florida Keys, as well as many other habitats are vital to the balance of our environment, just as those regions which have been included in the Coastal Barrier Resources System.

The loss of military and Coast Guard lands from this same system would also be disappointing, as these lands are important in maintaining an ecological balance.

Please reconsider these proposals. Each and every one of them play a key role in the environmental balance we seem to be losing day by day for the sake of "progress".

Sincerely,

Catherine Ursini
5/11/87

1041 B MACMORARA
AUSTIN TX
78758

424

[redacted]

DEBRA CALLANDRILLO, ART

May 16, 1987

Dear Sirs -

I want you to know that I support the proposed addition of over 1 million new acres to the Coastal Barrier Resources System. I am disappointed, however, that you failed to include the Great Lakes and the Pacific coast in the new acreage. These are two very important areas and they should be protected.

I also feel that all Coast Guard and military lands should be protected.

Our coastal areas are much too fragile to be left unprotected. We need the Coastal Barrier Resources System to protect these lands.

Thank you
Debby Callandrillo

49

April 22, 1987
[redacted]
Pickens, SC 29671

Sirs:

I live in a state (SC) which is a "beach capital" of the USA. At least weekly our local newspapers in the northern part of the state carry reports on our terrible beach erosion problem. The threat to tourism income, the cost of beach salvage, etc. - and I wonder anew each time I read when we are going to recognize and act on the knowledge of our limitations as humans in the face of the great forces of nature. Perhaps I don't understand economics well enough, but I know enough of interdependence in nature to know that we are a part of the grand scheme - not a separate force acting against -, and that, in the long run, working in conjunction with common sense and knowledge of natural facts will be the best thing for our total environment - which includes us.

So why don't you finish well what you have started so well - and include the Great Lakes and Pacific coasts in the Coastal Barrier Resources System? These shorelines serve the same natural functions and suffer the same natural disasters as other shorelines, don't they?

Thanks for listening.
Bert Allison, Teacher - science and children

259

124

Ivan H. Offord
506 Uluoa Street
Kailua, HI 96734

April 27, 1987

Mr. Frank McGilvrey
Coastal Barriers Study Group
U.S. Department of Interior
National Park Service - 498
P.O. Box 37127
Washington, D.C. 20013-7127

Dear Mr. McGilvrey:

SUBJ: Changes Proposed to the Coastal Barrier Resources System, as announced on Wednesday, March 25, 1987, in the Federal Register, Vol. 52, No. 57, pp. 9618 - 9619

The subject activity was discussed in a recent issue of Coastal Zone Management (Volume 18, Number 12, Nautilus Press, March 26, 1987), wherein the proposed deletion of Pacific and Great Lake coasts from the Coastal Barrier Resources System (CBRS) was reportedly defended by the Department of Interior (DOI) on the grounds that these regions have geologic structures, storms, and development pressures which are different from those of the East and Gulf Coast states. Assuming this report of justification to be true and complete, I stand opposed to the action now recommended by the DOI.

As you know, probably better than I, the CBRS Program is founded on the Coastal Barrier Resources Act of 1982 (CRBA) whose purpose is to minimize the loss of human life, the wasteful expenditure of Federal revenue, and damage to the Nation's fish, wildlife, and other natural resources. It was appropriate, I believe, to initially focus the CBRS Program on East and Gulf Coast states inasmuch as the greater population density in these areas has created a higher potential for damage from storms. I support the DOI's recommendation to strengthen the CBRS in these areas.

However, as to the DOI's reasons for recommending areal deletions in the West and on the Great Lakes, I do not believe it was the intent of Congress to adopt the East and Gulf Coast situation as a defacto standard against which to assess future

amendments to the CBRS. The storm and related damages on the Pacific, Great Lakes, and nation's insular coasts are also significant and justifies the consideration of these areas for inclusion in the CBRS.

As a follow-on point, I would like to suggest that the DOI again consider including portions of Hawaii in the CBRS. I am familiar with the CBRA, the CBRS Program, and Hawaii's coastal regions from my current position as a planner for the Hawaii Coastal Zone Management Program. It is my professional opinion that a number of geologic structures in the State are "coastal barriers" under the CBRA and should be included in the CBRS to further the purpose of the CBRA. Ironically, many are geologically similar to east coast barriers, are exposed to storms (i.e., hurricanes) of the same type, and are subject to the same type of development pressures; but for their location in Hawaii, I suspect that most would be recommended by the DOI for inclusion in the CBRS. .

Thank you for this opportunity to comment on the proposed rulemaking.

Sincerely

Brian Offord

103

Janine Schaeffer
39 Lawrence Ave.
West Orange,N.J.07052

Coastal Barriers Study Group
U.S.Department of Interoir,
National Parks Servuce-498,
P.O.Box 37127
Washington D.C.20013-7127

Dear Study Group,

I am in favor of the proposed addition of 1,010,646 new acres in the Coastal Barrier Resources System, including areas in the Florida Keys, the U.S. virgin Islands, Puerto Rico, Maryland, New Jersey, large embayments and adjacent aquatic habitats. However I feel that the Great Lakes and the Pacific coast should also be protected from developement and therefore included in the Act. Also I am opposing the deletion of military and Coast Guard lands from the Coastal Barrier Resource System.

Sincerely,

Janine Schaeffer

R.D. 1, Box 309A2
Altamont, NY 12009

1318

June 23, 1987

Mr. Frank B. McGilvrey, Coordinator
Coastal Barriers Study Group
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, DC 20013-7127

Dear Mr. McGilvrey:

The following comments are submitted for your consideration in review of the final draft Report to Congress: Coastal Barrier Resources System (CBRS). Only substantial program comments are presented, as a thorough review of the individually proposed CBRS units was not made.

1. Geographic Scope - Although Congress did not address the possibility of including barriers on coastlines other than the Atlantic Ocean and Gulf of Mexico, it would still be appropriate to recommend study and consideration of other coastlines on the basis of functional similarities that DOI must be aware of. In New York, protection of coastal barriers on the Great Lakes is of great importance for the same economic and ecological reasons that apply to Long Island. Therefore, I recommend that, at the very least, you identify and discuss the need to expand the scope of CBRA to include barriers on other coasts.

2. Associated Aquatic Habitats - I generally support this recommendation for the reasons stated by DOI. However, if only "undeveloped" segments and their landward aquatic habitats are included, then development pressures may be directed into valuable coastal habitats which happen to be located behind "developed" barriers. For this reason, I urge DOI to consider inclusion of all coastal barriers (as discussed in Comment 4 below), and include only those landward aquatic habitats that have been identified by New York State as "significant coastal fish and wildlife habitat".

3. "Otherwise Protected" Coastal Barriers - I support this recommendation, acknowledging the revision since 1985 that only privately owned property considered to be "otherwise protected" be included. Inclusion of public lands would not result in significant additional protection of fish and wildlife resources.

4. Proposed Conservation Recommendations - The final recommendation on p. 23 requires substantially more discussion and emphasis. DOI's proposal for a joint study to develop guidelines concerning redevelopment of coastal barriers following major storms or hurricanes is strongly supported for the reasons stated. However, it points out a major failing of the CBRS program as currently proposed, i.e., the requirement that CBRS units be essentially "undeveloped". Use of this criterion excludes many coastal barriers that are critical for protection of fish and wildlife resources, but are most vulnerable to development. Delineating only undeveloped coastal barriers would affect very few areas in New York that are not already "otherwise protected".

The purpose of the Coastal Barrier Resources Act (CBRA) is clearly stated in P.L. 97-348 (i.e. "... to minimize the loss of human life, wasteful expenditure of Federal revenues, and the damage to fish, wildlife, and other natural resources ...") and in the draft report to Congress (i.e., "... to put the burden of financial risk ... on those who choose to live on coastal barriers..." - p. 6), and makes no distinction between developed and undeveloped coastal barriers. Federal assistance for new or expanded development on any coastal barriers, whether developed or not, is inconsistent with the purposes of CBRA. Therefore, I strongly recommend that all coastal barriers in the Atlantic Coast and Great Lakes be delineated and included in the system, regardless of development status. This is the only way to provide a comprehensive and effective barrier resource conservation program, and should be thoroughly discussed in the report to Congress.

Thank you for the opportunity to comment on the draft report. Although there are several significant issues that need further discussion, I believe that establishment of the CBRS is a substantial and constructive program for habitat protection. I wish you success in completing the report, and hope that future efforts can be directed toward appropriate expansion of the system as outlined above. Please feel free to contact me at (518)439-7486 or at the above address if I can be of any assistance in this matter.

Sincerely,

Bryan L. Swift

Bryan L. Swift

BLS:lmd

136

April 27th 1987

U.S Department of Interior
P.O. Box 37127
Washington, D.C. 20013-7127

Coastal Barriers study group,

I am writing to voice my support of the proposed addition of 1,010,646 new acres in the coastal barriers Resource System, including the areas in the Florida keys, the U.S. Virgin Islands, Puerto Rico, Maryland, New Jersey, large embayments and adjacent aquatic habitats.

I am in opposition to the deletion of military and coast Guard lands from the Coastal Barrier Resources System.

I also urge you to include the Great Lakes and the pacific Coast into the system

Thank you

Sincerely yours,

Ty Wolenski
P.O. Box 1962
Sugarland, Texas
77487-1962

262

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The Coastal Barriers Study G p, U.S. Department of the Inte r
National Park Service--498, P.O. Box 37127, Washington, DC 20013-7

Coastal Barrier Resources Act: Section 10 Report to Congress; Fed. Register, Mar. 25, 1987

I support the principles of the Coastal Barrier Resources Act of 1982 to discourage development of these coastal areas by restricting federal funding for roads, bridges, sewers, water lines, or housing. I urge inclusion of the Great Lakes in the Coastal Barrier Resource System (CBRS). While the only barrier island, as usually defined, along the southern shore of Lake Erie may be Presque Isle, Penna., all these shorelines are vulnerable to storm and erosion damage. The record high lake levels are continuing to cause damage to homes and shoreline properties (Cleveland Plain Dealer, May 15, 1987) and to fish and wildlife habitat and other natural resources of the coastal area in Ohio and the Great Lakes.

I also support the proposed addition of one million acres to CBRS, including areas in the Florida Keys, U.S. Virgin Islands, Puerto Rico, Maryland, New Jersey, large embayments, and adjacent aquatic habitats. The Pacific coasts should also be added.

Associated aquatic habitats: I support the DOI recommendation to add all of the aquatic habitats associated with existing CBRS units to the CBRS. This would protect the fish, wildlife, and other natural resources of coastal barriers. These are inseparable parts of the coastal barrier ecosystem, including the Great Lakes.

"Otherwise Protected" coastal barriers: Development pressures are increasing in the Ohio coastal area for residential and recreational use, at the expense of coastal wetlands and fish and wildlife habitats. I agree with the DOI recommendation that all privately owned property within a conservation or recreation area established by federal, state or local law on an undeveloped coastal area be included by reference in the CBRS. Also that privately owned coastal barriers held for conservation purposes be automatically included in the CBRS if the not-for-profit owner ever proposes to sell the property for development that is inconsistent with the long-term conservation of the barrier.

Conservation: I support the recommendation for continued acquisition of CBRS lands, including user fees as appropriate. I oppose deletion of military and Coast Guard lands and federal roads from the CBRS. Military coastal barrier lands are just as vulnerable to natural processes and need protection from unnecessary development as much as barriers on private lands.

Regulatory consistency: The federal permits for activities on or adjacent to coastal barriers do affect these sensitive areas--such as permits for construction of boat docks or marinas, dredge and fill, and bridge construction. I recommend addition of a requirement that federal permits for activities within or adjacent to CBRS units be consistent with the purposes of CBRA. For example, disposal of dredged material is a concern for Ohio's ports and harbors. Dredged material from unpolluted harbors may be disposed in the open Lake. However, dredged material from the Maumee, Black, Cuyahoga and Ashtabula harbors contains toxic contaminants and should be placed in carefully constructed confined disposal or upland sites. The Corps of Engineers and the Fish and Wildlife Service and state agencies involved should agree on disposal of these materials "in a manner consistent with the purpose of this Act."

Recreational projects: To provide public access to coastal areas for recreation and enjoyment, the Ohio and local governments have expended considerable effort for parks, public beaches and natural areas. Such places may need assistance of federal funds toward these objectives, such as roads providing access. Please be sure that the program would not hinder such efforts.

Certification that each federal agency involved has complied with CBRA during the preceding fiscal year: I urge that the General Accounting Office replace OMB as the certifying agency since the GAO has access to the necessary information.

Next step: I support the recommendations for public education and for a joint study to develop alternative guidelines on which to base decisions concerning redevelopment of coastal barriers following major storms.

Thank you for this opportunity to express my views.

Edith Chase
5731 Caranor Drive, Kent, OH 44240

Edith Chase June 20, 1987

131

April 20, 1987

To Whom It May Concern:

I am writing to inform you that I support the proposed addition of 1,010,646 new acres in the Coastal Barrier Resources System. I am especially interested in the inclusion of the Great Lakes in the System.

Good luck in your efforts. Thank you.

Sincerely,

Leona Kirschenmann
847 Country Club Drive
Pittsburgh,
Pennsylvania 15228

63

Basil P. Tangredi, D.V.M.

Greenlawn Veterinary Clinic
(516) 757-8700

51 Broadway
Greenlawn, N.Y. 11740

Date: 22 April 1987

To: Coastal Barrier Resources Study Group

Re: Recommended changes - Coastal Barrier Resources Act

I find the proposed changes generally acceptable from an environmental point of view. I have several specific comments. First and foremost, the inclusion of associated aquatic habitats within the system would be a major improvement to the Act.

Secondly, regarding Section 6 (a)(2), which deals with dredge spoil disposal, I find the language rather vague. I strongly feel that some guidelines be stipulated such that only the cleanest dredge spoils be disposed of near barrier beaches. While the Environmental Protection Agency has a dredge spoil classification system, it has serious drawbacks. I might refer you to the system used by the state of Connecticut for dredge spoil classification for Long Island Sound. While it does not assess the biological toxicity directly, it nevertheless takes more variables into account than does the E.P.A. Furthermore, while the Army Corps of Engineers must participate in such decisions, I feel strongly (based on our experience here on Long Island with the Corps) that the Fish and Wildlife Service reserve final decision.

Finally, I would like to comment on the proposed study group to set guidelines for reconstruction following storms. This, like dredging, is a chronic environmental issue on Long Island. From this perspective, this subject has already been studied to death. What we need now is definite action to halt the futile waste of vast sums of money that occurs after each storm.

Signed: Basil P. Tangredi DVM

1144

June 22, 1987

Coastal Barriers Study Group
U.S. Dept of Interior
National Park Service - 498
P.S. Box 37127
Washington D.C. 200137127

To whom it may concern:

I wish to state that I support the proposed addition of 1,010,646 new acres in the Coastal Barrier Resources System, including areas in the Florida Keys, the U.S. Virgin Islands, Puerto Rico, Maryland, New Jersey, large embayments, and adjacent aquatic habitats; the incllusion of the Great Lakes and the Pacific coast in the System. I oppose the deletion of military and CoastGuard lands from the Coastal Barrier Resources System.

Sincerely,

Virginia Phelan
418 Baldwin Apt 103
Rochester, Mi. 48013

1016

203 Cranbrooke Dr.
Coraopolis, PA 1510
June 17, 1987

Dear Sirs:

I am writing to comment on the initial draft report concerning the Coastal Barrier Resources System. I strongly support your proposed addition of parts of the Florida Keys, Puerto Rico coastal areas, large areas such as Chesapeake Bay, etc. I do feel, howeve that the Great Lakes and Pacific coast should be alsc included. There have been so many problems with the high water levels on the lakes and the tremendous amount of damage caused, that this area should be a top priority of yours. The same holds true for the Pacific coasts, where we also need to limit shoreline construction and encourage land protection.

Please do not remove military and Coast Guard lanc from the system either, as we need to insure the care given these areas.

Thank you for your time.

Sincerely,

Sharon Sielski

Sharon Sielski

May 22, 1987

Dept of Interior,

566

I am glad to hear that your dept. proposes to enlarge the Coastal Barrier Resources System. The florida keys and Carribean Islands need their coastal Barriers to help break the impact of hurricanes common to that area.

But what about the Pacific Coast? I'm disappointed to hear that these are not consided so important to you. They are important to us. The unspoiled beauty of our northern California coastline is an economic resource to us - drawing many tourists. It needs protection, too. You must be aware of the growing grassroots support of a Pacific North Coast Ocean Sanctuary movement.

MAY 27 1987

Or are you obviously holding out for the oil companies? Excuse me, but your persuations are showing! Be fair and protect the North Coast Pacific, too. Lily Jones (Lily Jones and Clyde Jones)

PO Box 1515, Mendocino, Ca. 95460