GB459.5.M2 S35 1978
Maine - Coastal Zone Management Program

MAINE'S COASTAL SAND BEACHES:

RECREATION AND CONSERVATION

DRAFT
REVIEW ONLY

Prepared for the
Bureau of Parks & Recreation
Department of Conservation
State of Maine

by

James A. St. Pierre

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U.S. GOVERNMENT
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Work for this project has been conducted as part of the Maine Coastal Program, Maine Bureau of Parks and Recreation and Maine State Planning Office co-operating. Financial assistance was provided by the Coastal Zone Management Act of 1972, administered by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

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1.0 INTRODUCTION

There is a quiet secluded beach wedged in between, and hence protected by, two jutting stretches of land. Like other small beaches scattered here and there along the coast of Maine, its beauty is one of contrasts, and its significance lies in the analogy of life that these contrasts suggest.

--Faith Johnson,
"A Beach of Life,"
Maine Life, January, 1977

1.0 INTRODUCTION

In September 1976, the Maine Bureau of Parks and Recreation in cooperation with the State Planning Office, initiated a study to identify sites of outstanding significance in Maine's coastal area. Sites were sought which would be suitable for one or more forms of outdoor recreation and which could be considered worthy of protection because of the importance of their natural features.

Early in the project it became clear that due to their many unique characteristics, Maine's coastal beaches would be best treated apart from other sites.

This document is a working paper summarizing efforts undertaken during 1977-78 to outline beach recreation and conservation considerations from a state level perspective. It is background information for a larger report, The Maine Coast: Recreation and Open Space, prepared for the Department of Conservation and the Committee on Coastal Development and Conservation.

No analysis of outdoor recreation and conservation opportunities in Maine would be adequate without a special discussion of seaside beaches, because beaches are such an important recreational feature and open space resource, particularly in southern coastal Maine. Every year millions of residents and out of staters use the beaches for all types of recreational activities.

On January 9 and February 6-7,1978 two storms of record struck with full force the coastal beaches of southwestern Maine, The storms caused property damages in Maine estimated at more than $47 million. They were both a personal tragedy for many individuals and a societal debit where public beach resources were degraded. But inasmuch as they heightened public awareness, the storms may have, in some sense, been beneficial. Certainly they taught a lucid lesson for the future: be careful about building at the edge of the sea and about what uses are made of coastal beaches.

There are clear, objective scientific reasons why coastal erosion occurs, will continue from natural causes, and will be aggravated by human intervention. Marine geologists know very well, for example, that seawalls, in some locations, can accelerate shoreline erosion and ultimately debase those beach areas which are a public resource. At the same time, inappropriate building continues on coastal wetlands, including beach areas, in Maine. That much of this development will suffer expensive (personal and public) property loss from future flooding and erosion is entirely predictable. It is also avoidable.

As the importance, particularly the recreational importance, of our coastal beaches continues to grow, it behooves us to learn to

treat these fragile resources with the long term management respect they command. In the end any loss will be borne by all of us, while benefits retained can accrue to us collectively as a society.

A clear State policy, rooted in protecting the public's safety, welfare and long term recreation and conservation interests, regarding the prevention and restitution of shoreland property losses, needs to be formulated. This implies public acquisition of some sites, relocation of some houses and businesses, restriction of shoreline development with strict setbacks, and serious review of incremental and cumulative impacts of coastal land use and growth.

If we are to continue to enjoy coastal beaches, steps must be taken to insure their protection for recreational use and resource conservation. This report presents information which should be helpful in defining the issues at hand and in suggesting solutions to those problems.

Briefly stated the objectives of the report are:

- to compile and present in an understandable format information on the recreation/conservation activities relating to Maine's coastal beaches;

- to make this information available to public and private agencies and individuals concerned with the use and protection of coastal beaches; and

- to suggest proposals, based on information gathered, for the management of coastal beaches for conservation and recreational use.

2.0 THE NATURAL RESOURCE

Every grain of sand on a New England beach has a long and eventful history. Before it was sand, it was rock--splintered by the chisels of the frost, crushed under advancing glaciers and carried forward with the ice in its slow advance, then ground and polished in the mill of the surf....Now in this particular moment of its history, it belongs to the sea's edge--swept up and down the beaches with the tides or drifted alongshore with the currents, continuously sifted and sorted, packed down, washed out, or set adrift again, as always and endlessly the waves work over the sands.

--Rachel Carson,
The Edge of the Sea, 1955

2.0 THE NATURAL RESOURCE

2.1 Beach Defined

Beaches may be defined in a variety of ways depending on one's objectives. The Maine courts have had a difficult time defining the beach and the shore in legal terms. The study Maine Law Affecting Marine Resources included the following definitions from cases of shore:[1]

> What is the sea shore must first be defined. The sea shore must be understood to be the margin of the sea in its usual and ordinary state. Thus, when the tide is out, the low water mark is the margin of the sea, and when the sea is full, the margin is high water mark. The sea shore is therefore all ground between high water mark and low water mark (Storer v. Freeman, 6 Mass 435, p. 439; Laysesk v. Bangor Bank, 8 Me. 85 pg. 90 (1831).
>
> By beach, it is to be understood the shore or strand; and it has been decided, that the seashore is the space between high and low water mark (Coltis v. Hussey, 15 Me. 237, 241 (1839).
>
> The word beach, must be deemed to designate land washed by the sea and its waves; and to be synonymous with shore (Littlefield v. Littlefield, 28 Me. 180, 181 (1848).
>
> The "shore" is the ground between ordinary high and low water mark, the flats, and a well defined monument (Montgomery v. Reed, 69 Me. 510, 514 (1879); Morrison v. Bank, 88 Me. 155, 160, 33 A. 782 (1895).
>
> The word [shore] strictly means that space which is alternately covered and exposed by the flow and ebb of the tide, the flats between ordinary high and low water mark (Morrison, supra).

The term intertidal zone also refers to the area between high and low water, the area over which the ordinary tides flow daily.

---

[1]Harriet P. Henry, et. al, Maine Law Affecting Marine Resources, (Prepared under the joint sponsorship of the School of Law of the University of Maine and the National Science Foundation, 1969-70).

Maine beaches can roughly be characterized as sand, gravel, cobble or a mixture of these depending on sediment size. For the purposes of this discussion, the sand beach shall be defined as the zone of unconsolidated material (particles approximately 0.0625 mm to 2mm in size) that extends from the maximum low water line landward to include those supratidal formations which have a substrate of sand and associated floral communities as well as salt marshes. This definition incorporates a holistic ecosystem approach. It encompasses not merely the beach face but the entire beach system, including the intertidal zone, the frontal dune ridge, the back dune area and the transitional salt marsh-estuary area. It is important, particularly in managing sand beaches, to treat the total beach ecological system as an integral unit.

2.2 Beach Geology

Nelson & Fink have organized a four group classification scheme for Maine's coastal beaches according to response forms and geomorphic features. This scheme categorizes beach response forms by (1) major wave or (2) wind depositional forms, (3) minor wave depositional-erosional forms and (4) sedimentary structures. Generally speaking, in southern Maine, the most extensive and most important recreational beaches are large fringing beaches such as Old Orchard, Crescent and Fortunes Rocks Beaches. Along many of these beaches the entire dune field, from the frontal dune ridge through the aeolian flat, has been developed resulting in a interruption of the natural beach dynamics. A few large beaches do remain in a relatively natural state. Scarborough Beach, for instance, is a closed barrier beach with low relief parabolic dunes and healthy stands of wormwood, beach heather and pitch pine.

East of Georgetown are a large number of small pocket beaches. Pemaquid Beach, for example, is a mid-bay pocket beach with an unbroken strandline fronting a salt marsh. Many beaches along this part of the coast are located on offshore islands. Sand Cove Beach on Marshall Island is a pocket beach with a storm berm barrier protecting a fresh water marsh.

Nelson & Fink report that there are four principal sediment sources of sand supplying Maine's coastal beaches: (1) the erosion of distant glacial drift deposits located along rivers, (2) the reworking of local glacial deposits by wave erosion, (3) the erosion of nearby headland bedrock, and (4) the transport of degraded skeletons and shells from adjacent shallow marine waters.

From its source sand is transported to and deposited at the limit of wave action on the beach. There it is acted on by a variety of natural physical forces. A dynamic, action-reaction equilibrium is established as the beach material and physical forces interact. Once an equilibrium is established it is normally only a matter of time before the effect of an unbalancing force (e.g., a coastal storm) is compensated for by a feedback response. In this manner, a give and take process-response mechanism is established.

As part of the process-response equilibrium, beaches exhibit seasonal changes largely due to varying amounts of wave action. During winter months they tend to be erosional with a steepened beach face. In the spring, summer and fall they are usually, in net, accretional, forming berms on the upper face and ridges on the lower. At all times beaches normally have a steeper slope and so are better drained than intertidal flats.

2.3 Beach Botanical Features

The zones of a beach ecosystem of botanical importance occur principally landward from the frontal dune ridge where there is a clear line of vegetation growth. On the beachface itself the diversity of lifeforms is limited by the continual shifting of the sand grains and the flooding-dessication cycle of the tides. In fact, these forces allow virtually no microalgae development.

The flora of the frontal dune ridge includes dune grasses of the highest salt, sun and temperature tolerance. To survive in this harsh environment these plants must also thrive (1) in soils lacking humus, (2) in an unstable substrate subject to extreme sand movement, and (3) in a substrate with a widely varying supply of moisture.

In a complex, undisturbed beach system, there is a clear zonation of plant community types from the frontal dune ridge to the salt marsh. Nelson & Fink have described these communities for Maine beach-dune systems through the forest community. The foredune is divided into the saltworts and sea rockets of the seasonal berm and the beach grass, beach peas and dusty millers of the perennial berm. American beachgrass is the dominant plant type of the next zone which stretches from the frontal dune ridge to the zone of heath or shrub growth.

The third zone, the dry dune slack community, is characterized by beach heather and other plants which grow where salt spray and sand burial rates are lower than for more seaward communities. An abundance of lichens in the backdune area of certain beaches is said to be peculiar to Maine and is the result of the high incidence of coastal fog.

The fourth zone is the shrub community, dominated by bayberry, Virginian rose, meadow sweet, raspberry, gooseberry and poison ivy.

The dune forest community is the most inland dry dune floral association. Pitch pines are usually dominant where salt spray stress is greatest. Other woody species include red maple, Northern red oak, white birch, serviceberry and quaking aspen. In low, moist backdune areas the dominant vegetational types are alder, poplar, winterberry and serviceberry.

In the most complex beach systems the dunes are backed by some type of wetland - a salt marsh, estuary, brackish pond or tidal bay.

Where a saline wetland is present, this zone is usually broken down into the transitional marsh, the high marsh, the low marsh and the water or flats. In the transitional zone are found salt marsh asters and sedges. High marsh plants are subject to inundation only during fortnightlyspring tides and other periods of high tidal action. The dominant plant is Spartina patens. In the low marsh Spartina alterniflora predominates. The low marsh is subject to inundation during all tides.

Where there is an estuary embayment there is an invaluable biological resource, for estuaries are one of the most nutrient rich, high productivity environments on earth. The beach, the dunes and the seaward salt marsh all help to protect the estuary or backdune wetland. Each should be treated not disparately but as part of the whole system.

Maine beaches are the northern coastal range of a number of plant species. It is unfortunate from an ecological point of view that most of the major dune fields in Maine have been heavily developed or altered by foot traffic erosion and dike construction. Development on many beaches has precluded the detailed study of range distribution of a number of species. Those dune fields which remain undisturbed are important for the preservation of natural diversity, for they can provide opportunities for scientific research and education of future generations about the natural heritage. Of course, they are important too for the protection of the beach as a recreational resource, and of the coastal wetlands as habitat for a variety of marine organisms as well as a natural vessel of flood water storage.

2.4 Common and Special Characteristics

Despite their differences, it is generally agreed that virtually all of the beaches of the Maine coast have several things in common:

- they are recent geological formations, in evolution over the last 6000-7000 years during which time sea level has been slowly rising relative to the land;
- they are dynamic boundaries changing position to establish an equilibrium between interacting materials and forces;
- they are subject to some of the highest tides in the world and generally exhibit expansive intertidal zones;
- most are now sediment starved which implies either a diminishing supply of sand from offshore deposits or such a rapid landward retreat that the current supply rate is inadequate;
- they are changing (mostly eroding) at various rates in response to an accelerated rise in sealevel; and
- they are collectively one of the state's most important recreational and economic resources.

In addition, some geologists believe that the beaches of the Maine coast are set apart from beaches elsewhere because:

- most erosion and accretion on Maine's small beaches result from movements of sand primarily in an onshore-offshore direction rather than from alongshore transport;[1] and

- Maine's parabolic dunes may be of national significance because they are formed by northwest offshore winds rather than by onshore winds and are only infrequently obliterated by washovers during major storms.[2]

2.5 Beach Extent

In assessing the recreational potential of coastal beaches, it is most useful to look at the size of the beachface and berm, that is, generally the foreshore and the backshore or the area between low tide and the line of vegetation. This area, unlike the dunes and salt marsh, is one part of the beach system most tolerant to onsite use. But the beachface and berm are changeable and not susceptible to precise definition by fixed measurement, though a range of beach area can be estimated on the basis of seasonal profiles. A single dimensional measure, lineal extent, is often used as an approximation of available beachfront area.

Of the approximately 3,500 miles (5630 km) of mainland and island tidal shoreland in Maine, only a little over 70 linear miles are sand beaches. Roughly 40% of this beach length is accounted for by the beaches south of Casco Bay. Nonetheless, in terms of recreational importance the southern coastal sand beaches are far more significant, for they accommodate the great bulk of recreational use and as a group are the most intensively used beaches in Maine.

2.6 Threats to the Resource

Maine's coastal beaches, taken as a whole, are a scarce resource of statewide significance, one which should be protected from degradation to maximize its utility. There are a number of impending threats to the resource, both natural and human induced.

2.61 Development - Already many of the beaches have been drastically altered by development. Seaside homes, walls, piers, groins and jetties all have an effect on the ability of the beach-dune systems to adjust to seasonal as well as long term changes. Development can be particularly troublesome where it inhibits the natural washover

---

[1] Bruce W. Nelson and L. Kenneth Fink, Geological and Botanical Features of Sand Beach Systems in Maine (draft report prepared for the Maine Critical Areas Program, 1978), p. 12

[2] Ibid, p. 54.

process. Over time, washover allows the landward migration of the barrier beach system - a process necessary for survival of the beach under stress from an accelerating rise in sea level.

There is abundant evidence from other East coast systems that washover is the dominant process by which beaches respond to storms and rising sea level. At least one marine geologist feels that washover processes are rapidly overtaking wind processes as the dominant forces in the dynamics of many coastal beaches in Maine. As this occurs, undeveloped beaches can be expected to migrate landward; developed beaches will become more severely erosional. Though we have a better understanding of beach dynamics than in the past and despite recent legislation to control shoreland development, structures continue to be built along beaches in Wells, Scarborough and in many other coastal towns.

2.62 Recreational Use - Recreational use of beach areas may have an adverse effect on ecosystem integrity too. The beachface is the zone most tolerant to usual beach uses, including swimming, sun bathing and fishing. The dune areas backing up the beach are much less tolerant. The frontal dune ridge, for instance, is highly susceptible to abuse. Many marine geologists and land managers say it should not be used for any sort of development except boardwalks, or preferably elevated crosswalks. From the viewpoint of optimum, long term conservation of the resource, the frontal dune ridge should never be artificially breached.

It has been suggested that there are three primary considerations which delimit specific criteria by which the recreational carrying capacity of Maine's coastal beaches can individually be determined.[1]

1. The direct impact of parking lots and accompanying user facilities on the vegetated portions of a beach ecosystem (viz., the dunes).

2. The impact of pedestrian traffic on the vegetated areas between the beach and inlying parking lots and user facilities.

3. The social and managerial limits of the beachface and berm areas which are the more use tolerant recreational portions of a beach system.

Certainly the impact of parking lots and walkways can be minimized through sensitive design, construction, management and an understanding of beach systems. Determining the carrying capacity range of a beach may be more difficult. In any case, costs must be reconciled against benefits, both tangible and intangible.

---

[1] L. K. Fink, "Considerations for Determining Carrying Capacity of Maine's Coastal Beaches for Recreational Use," (unpublished), March 1977.

2.63 Vehicular Use - Maine, unlike some areas, has not had a serious problem with beach misuse by offroad vehicles, all terrain vehicles, snowmobiles, airmobiles, trailbikes, dune buggies, etc. The threat of these is always present, however, at least on private beach properties.

2.64 Erosion - Erosion of sand on Maine's coastal beaches results from both natural and artificial causes. Some degree of erosion is as much a part of the natural dynamics of beach systems as is accretion.[1] Nevertheless, the most significant threat to Maine's coastal beaches today is that of human induced erosion. The 1971 National Shoreline Study estimated that at the time there were "about 20 miles of shorefront experiencing critical erosion...mainly in the recreational beach areas of southern Maine where serious offshore losses experienced during frequent storms have lowered and reduced the beach width to below protective and recreational use requirements."[2] The study principally addressed erosion exacerbated by beachfront development.

In 1977, the Maine Bureau of Geology undertook an inventory of Maine shoreline erosion. It was found that "most natural sand beaches in Maine exhibit erosion to some degree or another."[3] Annual recession rates at sites where repetitive observations are available range from a fraction of a foot to more than 85 feet (26 meters). Some of this erosion is natural, the response to stresses such as an accelerated rise in sea level. However the loss of sand offshore and to back beach estuaries has been enhanced by dredging, river damming and other projects. Coastal engineering works, in particular the construction of seawalls, is one of the most serious causes of induced erosion on Maine's coastal sand beaches.

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[1] A change occurs in the location of real property lines where water boundaries shift gradually by erosion, accretion, or reliction. "When the line between land and water is changed due to the gradual deposit of soil (accretion) or by the imperceptible recession of the water (reliction), the owner becomes entitled to the new land. Conversely, if land bordering on water is gradually and imperceptibly worn away by the natural elements (erosion), or the water gradually encroaches, the owner looses such land. However, sudden or perceptible changes (avulsion) have no effect on the location of such boundary lines." Paul G. Creteau, Principles of Real Estate Law (Portland, Maine: Castle Publishing Company, 1977), p. 212 n 30.

[2] US Army Corps of Engineers, National Shoreline Study, (Washington, D.C.: GPO, 1971).

[3] Barry S. Timson and Donald Kale. Maine Shoreline Erosion Inventory (unpublished, prepared for the Maine State Planning Office, 1977) p. 50.

The consequence of building on the frontal dune ridge or back dunes is often the destruction of personal property and the degradation of a recreational resource important to the public at large. When beaches are no longer capable of providing natural protection from erosion to the backshore and, in fact, are under natural stresses to erode further, they often become covered with gravel or exposed to their rocky substratum terraces. The result is a diminution of recreational appeal. The effects of historic and recent winter storms indicate the folly and economic catastrophe of beachfront development. There are ways, including nonstructural methods, of mitigating erosion. Those techniques which have demonstrated the most success at the lowest cost with the least long term, adverse impacts on the surrounding physical environment should be encouraged.

That shoreline erosion has become a problem of far reaching national proportions was recognized in the National Shoreline Study:

> Probably the most significant and important with respect to erosion is the loss of beach recreation area, a valuable natural resource. Counts of users of good beaches less than one-half mile long show hundreds of thousands of visitors each year. Considering all the beaches of the United States, there are many hundred million beach visits each year...Obviously, beach losses affect a considerable percentage of our population. The population expansion and increased leisure time cause rapidly increasing demands for beach areas. Because the quantity of beaches is limited, continued loss of beach areas will increase in importance and economic value.[1]

2.65 Private Ownership - The fact that Maine beaches are taken to be privately owned to low water is becoming a source of trouble for beach protection programs. As an example, in the town of Wells a struggle has been ensuing for some time over the pumping of sand onto nearby eroded beaches when the town harbor is dredged. Some beach front property owners are struggling to have the sand deposited on their depleted beaches. Others are fighting the action. The result has been local indecision and delay of projects which could nourish badly eroded beaches. Were the intertidal area publicly owned, such problems might be avoided.

2.66 Property Taxes - Soaring coastal property values in recent years have acted as a disincentive to beach conservation. As beaches have been subdivided and sold to those willing to pay prices heretofore associated with property in more urbanized states, tax assessments have increased tremendously. These effects could be the basis of tax reform proposals to encourage, rather than discourage, beach conservation.

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[1] US Army Corps of Engineers, National Shoreline Study (Washington, D.C.: GPO, 1971), p. 13.

3.0 OWNERSHIP AND USE

"People who live on a beach should be able to live on the beach and to build a sea wall."

--Cam Ellis resident, news item
Maine Times, June 16, 1978

3.0 OWNERSHIP AND USE

3.1 Ownership

Coastal ownership patterns vary from state to state. In many states beaches, at least from mean high tide seaward, are considered part of the public domain. In Maine, except in a very few cases, private ownership extends to low tide or 100 rods (503 meters) from high tide whichever is less.[1] However, many beaches in this state, while technically privately owned, have for years been used as public common lands. In several instances coastal communities have budgeted funds for beach maintenance (e.g., Scarborough, Wells, York, Saco). In some towns officials have authorized projects, such as beach cleaning, which threaten the very resource they sought to enhance (e.g., Old Orchard Beach, Kennebunk, Scarborough). In one or two towns recent research has suggested that beaches heretofore thought to be private may actually be publicly owned (e.g., Kittery).

Hence, there are no definitive figures on beach ownership for the entire Maine coast. The Army Corps of Engineers in its National Shoreline Study, issued in 1971, estimated that only one-half of one percent of the Maine coast was in public recreational use though 3.2% was in local, state or federal public ownership[2] (not all of which is available for public use). A report on Coastal Conservation Priorities prepared for the State Planning Office in 1973 estimated *total* coastal federal ownership to be 1.2%, state ownership 1.3%, and local ownership 0.5% of the shoreline of the Maine coast[3].

For the purposes of this discussion coastal linear sand *beach* ownership in Maine is estimated in Table 1.

[1]To quote the 1814 Edition of Ancient Charters and Laws of the Colony and Province of Massachusetts Bay, p. 148 (better known as the Colony Ordinance of 1641-47): "Sec. 3. It is declared, that in all creeks, coves, and other places about and upon salt water, where the sea ebbs and flows, the proprietor, or the land adjoining, shall have propriety to the low water mark, where the sea doth not ebb above a hundred rods, and not more wheresoever it ebbs further."

[2]U.S. Army Corps of Engineers, National Shoreline Study, North Atlantic Region (Washington, D.C.: G,PO, 1971), p. 103.

[3]Reed and D'Andrea, Coastal Conservation Priorities Plan (South Gardiner, Maine, 1973) p. I-6.

Table 1

ESTIMATES OF COASTAL LINEAR SAND BEACH OWNERSHIP IN MAINE

Jurisdiction	Miles	(Km)	% of Coast	% of Beach
Federal Beaches	0.2	(0.3)	*	0.3
State Beaches	6.3	(10.1)	0.2	8.5
Local Beaches	9.2	(14.9)	0.3	12.5
Private Beaches	58.2	(93.7)	1.7	78.6
TOTAL**	73.9	(119.2)	2.1	100.0

*Less than 0.01%
**Columns are not necessarily additive due to rounding

Federal coastal beach ownership in Maine, unlike many states, is minimal. Only one beach of any significance, Sand Beach in Acadia National Park, is under federal jurisdiction. Other than this, there are some beach associated wetlands held by the Fish and Wildlife Service. Most of these - such as the Webhannet marsh, part of the Wells Beach ecosystem or the Goosfare Brook marsh, part of the Saco Bay Beach system - are located in southern Maine.

At the State level the Department of Inland Fisheries and Wildlife owns portions of beach related marshes and tidal wetlands. However, only the Bureau of Parks and Recreation holds beachface areas associated with the traditional beach recreation activities. The Bureau's beach parcels are listed in Table 2.

A number of sand beaches in Maine, such as Ogunquit and Old Orchard Beaches, are clearly in municipal ownership. Nevertheless, many beaches popularly thought to be locally owned are actually in private ownership.

In short, roughly four-fifths of the beaches on the Maine coast are outside the public domain. Regardless of the statistics, ownership does not tell the entire story. Some private beaches along the Maine coast are used as if they were public and some publicly owned beaches remain unavailable because they are inaccessible or undeveloped.

To add to this complex situation the public has certain rights along specific parts of the beach irrespective of ownership (except

Table 2

COASTAL BEACH PROPERTIES UNDER THE JURISDICTION OF THE MAINE BUREAU OF PARKS & RECREATION

BEACH	DEVELOPED	UNDEVELOPED	MUNICIPALITY	APPROXIMATE BEACH FRONTAGE FEET	(METER)
Andrews		X	Portland	930	(280)
Birch Point		X	Owls Head	600	(180)
Crescent, Kettle Cove	X		Cape Elizabeth	5,450	(1,635)
Eastern Head		X	Trescott	500	(150)
Ferry		X	Saco	490	(149)
Lamoine	X		Lamoine	940	(282)
Laudholm		X	Wells	1,800	(540)
Little Chebeague		X	Portland, Cumberland	3,250	(970)
Popham	X		Phippsburg	6,750	(2,025)
Reid	X		Georgetown	6,000	(1.800)
Roque Bluffs	X		Roque Bluffs	2,400	(730)
Scarborough	X		Scarborough	67	(20)
TOTAL				29,177	(8,760)

perhaps on federal military lands). Anyone can, for example, moor or rest a boat on tidal flats, sail over the flats, cross the flats to go to or from one's boat, take on or discharge passengers or cargo, fish, dig clams and worms, and hunt for wildfowl below the high water mark.

These rights are stated in the Colony Ordinance of 1641 as amended in 1647, which it is generally assumed forms the basis for public shore rights in Maine. The Colony Ordinance was enacted in Massachusetts and Maine was previously a territory of that Commonwealth. Notably absent from the list of permitted uses of the intertidal area is mention of recreational activities. Judicial interpretation of the application of the Colony Ordinance in Maine suggests that recreational bathing, walking and so on may be permitted shore uses, although the point has never been clearly tested. In any case, it is certain that the right of trespass across private lands to the seashore as applied to Great Ponds is not in force. The inability to get to the intertidal zone across private property from inland points makes public recreational rights for most people a moot advantage.[1]

Under our existing body of law it is likely that if public opportunities for beach recreation are to be extended to new areas, property rights affording access to the beach will have to be acquired. Improvement of facilities servicing existing beaches could also help satisfy demand.

Amendments to the federal Coastal Zone Management Act passed in 1976 specifically authorize "the Secretary of Commerce to make 50% grants to any coastal State to acquire lands to provide access to public beaches and other public coastal areas of environmental, recreational, historical, aesthetic, ecological, or cultural value and to preserve islands." For those states which have met the federal requirements, it is expected that funds will be made available for improving access to and protecting public beach areas.

3.2 Recreational Use and Preferences

Though in the past Maine's beaches have been used as sources of sand and sites of commerce, recreation is now the most important use. They have been the location of swimming, sunbathing, and other recreational activities for decades. During the 19th century

[1] It does not appear either that a public easement to the public submerged lands or to public shorefrontage would be implied by necessity. Where land borders on the ocean no right of way by necessity for the beneficial use of the land exists across the remaining land of a grantor, although access by water may not be as convenient as access by land. On the other hand, "where such access by water is rendered virtually impassable due to a perilous surf or other reason, a way of necessity will usually be implied." (P.G. Creteau, Principles of Real Estate Law, Portland, Maine: Castle Publishing Company, 1977, p. 139).

many of the summer colonies in the state grew up around the beaches, particularly of southern Maine. In this century, the mobility of the automobile has made the coast more easily reached by even larger numbers.

In the 1977 Maine Comprehensive Outdoor Recreation Plan swimming needs were calculated on a district basis. While the peak day demand capacity analysis did not address coastal beach use alone, it did give an idea of regional facility needs. The calculations revealed current deficiencies in the Cumerland and Mid-Coast Districts. As the report pointed out, swimming is one of the hardest activities to analyze because of the difficulty (1) in accounting for the demand satisfied at personal pools and beaches, (2) in measuring the capacity of existing beach areas, and (3) in assessing the volume of use at coastal beaches from nonresidents.

In the spring of 1977, a leisure time use and preference telephone survey was conducted for the Bureau of Parks and Recreation. The survey showed that 32% of the respondents statewide participate in ocean swimming, each spending an average of 13.5 days at the beach each summer. Not surprisingly, both the proportion and number of participation days were higher for coastal respondents than those who live inland. Participation in ocean beaching was also higher for city dwellers than for nonurbanites. One-quarter of the respondents said they do their beaching at state parks - a larger proportion than at any other specified location. There is also a clear relationship between beach use and length of residence in Maine: the longer respondents had lived in Maine the less likely they were to participate in ocean swimming. Correspondingly, a larger percentage of younger respondents said they participate than older, though the average number of days per person was not very different. Finally, when asked if the State should or should not spend more money on developing swimming areas on the coast, three-quarters of those interviewed supported additional expenditures.

This last question of preference spending is supported by earlier surveys. A 1973 opinion survey found that coastal beaches and scenic areas were the top priority when respondents across the state were asked what type of recreation facilities should be developed "if the State had additional funds." In the York and Cumberland Districts coastal beaches were favored by 61-70% of the respondents.[1] Similarly, in a 1975 survey of coastal residents, over 70% of those questioned supported more State spending for public coastal beaches.[2]

[1]Northeast Markets, Inc., Maine, An Appraisal by the People (prepared for the Maine State Planning Office, 1973), p.30.

[2]Social Science Research Institute, Citizen Evaluation of Public Policy in the Coastal Zone (prepared for the Maine State Planning Office, 1975), p.95.

There are a myriad of obstacles restricting public use of many of our coastal beaches. Cold seawater temperature and dangerous currents scare away some. Crowds and offensive social behavior deter others. In some locations a lack of physical access precludes use. Even at beaches with access ways inadequate parking facilities may limit use. Inadequate backlands for the development of ancillary facilities is one of the most important obstacles; this coupled with public reluctance to walk any distance or use shuttle transportation. A few State owned beaches for which development lands and funds are available sit unimproved and inaccessible for want of ongoing operations money.

3.3 Use Impacts

Maine's salt water beaches every year draw millions of recreationists to the coast, both residents and nonresidents. People are attracted in particular to the large southern beaches during the summer. This beach related tourism offers both positive and negative economic, social and environmental impacts.

In 1972-73 a study was undertaken to assess these impacts as well as those of other tourism activities. The study report, Tourism in Maine: Analysis and Recommendations, issued in May 1974, quantified the impacts of salt water beaching in Maine. The economic impact summary sheet for this activity is presented on page 23.

While it was found that saltwater beaching is among the most expensive of tourist activities for local and state governments (at least in southern Maine) the relative importance of coastal beaching to the total state tourist economy is obvious. The cash flow economic spinoffs from nonresident beachgoers ranked a notable second behind skiing.[1]

At the same time, the social and environmental impacts of saltwater beaching were judged to be average among tourist activities. Congestion and effect on shoreline use were the greatest impacts. Fuel consumption, property damage/danger and pollution were the least serious impacts. It should be pointed out that the study dealt only with the short lived impacts of tourism (defined as "the activity of journeying into, within or through the State for purposes of recreation, pleasure, culture or business"). The long term social and environmental consequences, for example, of building homes and accommodations for transients on the beach were not evaluated. What the study did clearly do is demonstrate the disproportionate significance of coastal beach recreation and related tourism in Maine to the towns and the state as a whole.

[1] A.D. Little, Inc. et al. Tourism in Maine (prepared for the Maine Vacation Travel Analysis Committee, 1974), IV B.

IMPACT SUMMARY FOR SALT-WATER BEACHING [1]

		Overall	Non-Resident	Resident
Number of Tourist Days:	Fall	197,316	70,458	126,850
	Winter	11,434	11,434	-----
	Spring	75,456	26,509	48,947
	Summer	1,173,183	571,606	601,577
	TOTAL	1,457,389	680,007	777,382
AVERAGE Expenditure Per Day:		$9.34	$17.46	$2.32
SALES Per 1,000 Tourist Days:		$16,583	$31,151	$3,840
SALES Per Total Tourist Days:		$24,168,010	$21,182,627	$2,985,383
INCOME Per 1,000 Tourist Days:		$3,766	$7,145	$809
INCOME Per Total Tourist Days:		$5,487,849	$4,858,410	$629,439
EMPLOYMENT Per 1,000 Tourist Days:		9.37	17.88	1.93
EMPLOYMENT Per Total Tourist Days:		13,660	12,157	1,503
TAX REVENUE Per 1,000 Tourist Days:		$863	$1,586	$230
TAX REVENUE Per Total Tourist Days:		$1,257,587	$1,078,711	$178,876
STATE EXPENDITURES Per 1,000 Tourist Days:			$340	$230
CASH FLOW Ratio (Revenue/Exp.):			4.64	1.02

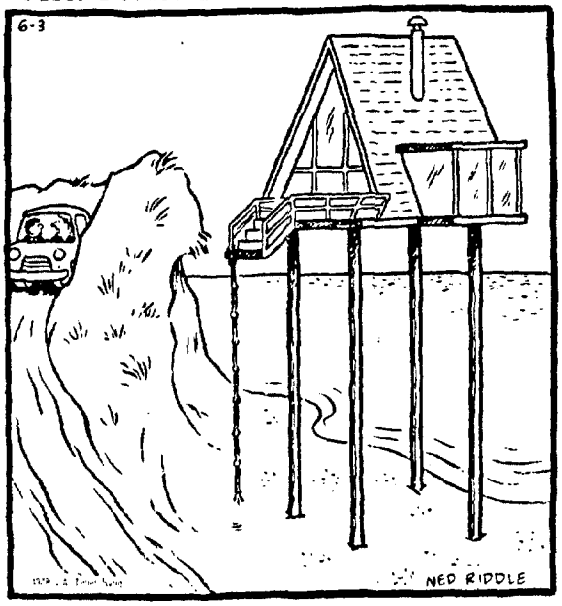
COMMENTS

Salt-Water Beaching ranks sixth among all activities in terms of total tourist days. The majority of Salt-Water Beachers come to Maine in the Summer--a full 80% of all Salt-Water Beaching tourist days in 1972/1973. The total was divided about equally between Residents and Non-Residents. As is true with most tourist activities, the Non-Resident spends considerably more per day ($17.46 vs. $2.32) and, consequently, has a more significant impact. Non-Resident expenditure is clustered into hotels, motels, and tourist courts; restaurants and food stores, and miscellaneous retail purchases. Because the Non-Resident Salt-Water Beacher spends so much more, he generates much more in terms of State tax revenue than the Resident. However, the Non-Resident spends more time on the highway and, therefore, costs more in terms of State expenditures. Nevertheless, the cash-flow ratio is much higher for the Non-Resident than for the Resident (4.6 vs. 1.0).

In terms of seasonal impact, the Non-Resident who comes in the Spring spends the most per day and the Non-Resident in the Fall spends the least among Non-Residents.

[1] All figures in 1972 dollars, except employment which is expressed in man-months.

MR. TWEEDY by Ned Riddle



"I HOPE YOUR MUSCLES ARE TONED UP. THIS PAST WINTER DID SOME RATHER FREAKY THINGS TO OUR BEACH CABIN."

4.0 CONSERVATION ACTIVITIES

4.1 Federal

4.11 Studies - Numerous federal studies over the last quarter century have reiterated the importance of coastal beaches to the social and economic well being of Americans nationwide. In 1954 the National Park Service was directed to identify remaining places on the eastern and southern coasts of the United States with valuable recreational qualities as well as areas desirable as sanctuaries for unique or rare plant and animal communities. The report issued by the Park Service in 1955, Seashore Recreation Survey of the Atlantic and Gulf Coasts, identified two high priority beach areas in Maine: the Popham-Seawall Beach region in Phippsburg and the Crescent-Ram Island Farm Beach region in Cape Elizabeth. Portions of both regions have since been placed under public or private conservation management for recreation use and resource protection.

The 1962 report of the Outdoor Recreation Resources Review Commission listed no particular Maine beaches for protection. However, the ORRRC report Shoreline Recreation Resources of the United States tagged beaches as "by far the most popular kind of shoreline in present patterns of outdoor recreation activities." The report pointed out that the important shore areas were those which are both accessible (especially those near metropolitan areas serving as day use beaches) and available (notably public beaches with adequate parking).

Four other major reports issued between 1968 and 1971 also identified beaches, particularly beach areas near urban centers, as one of the most significant shoreline recreation resources in the country.

> From Sea to Shining Sea, A Report on the American Environment - Our Natural Heritage. President's Council on Recreation and Natural Beauty, 1968.
>
> Our Nation and the Sea. Commission on Marine Science, Engineering and Resources, 1969.
>
> The National Shoreline Study. U.S. Army Corps of Engineers, 1971.
>
> "Papers on National Land Use Policy Issues." U.S. Senate Committee on Interior and Insular Affairs, 1971.

Aside from the 1954 Park Service study mentioned above, several federal studies have dealt specifically with coastal beaches in Maine. The Army Corps of Engineers, for instance, has issued study reports on beach erosion control on three York County beaches:

Saco (1957), Short Sands (1970) and Long Sands (1971) in York. More recently the Fish and Wildlife Service (USDI) has sponsored a study detailing an Ecological Characterization of Coastal Maine (1978) including information on sand, gravel and cobble beach fauna. Additionally, the Time & Tide Resource Conservation and Development Area in midcoastal Maine, a project of the Soil Conservation Service (USDA), has assisted in dune stabilization projects at public beaches and helped fund one study of oceanic processes.

Between 1937 and 1975, ten national seashores were established across the country. At one point portions of and the Maine coast in its entirety were proposed for inclusion in the National Seashore Program. However, with the enactment of the 1972 Coastal Zone Management Act, the emphasis on beach protection has shifted to the state and local levels.

4.12 Coast Zone Management - In 1976, Congress passed several amendments to the Coastal Zone Management Act. One of these dealt specifically with beach access and protection. The intent of the amendment was clearly stated in the discussion in the House report:

> "Access to public beaches and other attractions in public ownership in the coasts has come to be identified as one of the critical problems facing local and state governments...The Committee position is that action is needed now to help provide the needed access, especially in urban areas, and that to wait will only mean additional expense to the taxpayers. The key again is that the purchase of such access...be tied to a comprehensive plan. That is the intent of this new requirement under 305 program development - that all such purchases fit into an overall program for each state."[1]

With the passage of the CZMA amendments Congress did not sanction the acquisition of new public beaches. Rather it made it a requirement that state coastal programs provide for an assessment of the adequacy of access to existing public shorelands. At the same time, funds were authorized (up to $2.5 million annually for fiscal years 1977-1980) for the acquisition of "lands to provide for access to public beaches and other public coastal areas of environmental, recreational, historic, esthetic, ecological, or cultural value, and for the preservation of islands." To date, nevertheless, no money has been appropriated for the program.

One requirement of the shorefront access amendment is that states define the term "beach". As suggested by the discussion in

[1] U.S. Congress, House of Representatives, Report No. 94-878 (94th Congress, 2nd session, March 4, 1976).

section 2.1, in Maine defining beach, at least in a legal sense, is no simple task. For the purposes of meeting the requirements of the federal statute it may be necessary to define beach in a different manner than that suggested here.

The CZMA amendments also require the identification of existing public beach areas requiring further access and/or protection as a part of the State's coastal management program. This work is in progress. By September 30, 1978 the State must have an approved planning process for assessing public access needs to, or protection of, beaches and other valuable coastal areas in order to receive funds for program implementation and management.

4.13 Policy - Although still somewhat confused, in recent years a national policy on beach dynamics has been emerging. The National Park Service, for instance, has officially announced that it will no longer attempt to prevent beach erosion on its shorelands.

At the same time, the U.S. Army Corps of Engineers in the past a proponent of structural means to mitigate shore changes, is moving away from beach structures. The Corps now favors nonstructural methods for preventing the erosion of sand beaches such as planning, zoning and dune grass planting, where practical. Two years ago the Corps issued a report on the feasibility of building a stone revetment at Camp Ellis in Saco. According to the report the revetment would not be cost effective. In years past the Corps would have welcomed the opportunity to construct a structure at Camp Ellis.

There are indications that the Soil Conservation Service, too, may be moving away from beach structures, though it has steadfastly refused to remove a dike on Ogunquit Beach built to replace a damaged natural dune. Many citizens feel the dike was improperly constructed and has caused more damage than benefit.

Additionally, the 1976 amendments to the Coastal Zone Management Act require that to receive CZM funds states must develop a planning process to assess the effects of shoreline erosion. This process is to include an articulation of appropriate state management policies, be they structural, nonstructural or a policy of noncontrol.

There are a number of other federal laws which also allow for the implementation of alternative management solutions, including:

- The 1936 Flood Control Act which provides for use of nonstructural solutions;

- Section 3 of the Rivers & Harbors Act of 1968 which provides for assistance in evacuating or relocating properties from high hazard areas in lieu of structural flood reduction solutions;

- The Land & Water Conservation Fund Act of 1965 which allows for open space acquisition in flood plains for recreational purposes;

- Section 1362 of the National Flood Insurance Act of 1968 which would, if funded, provide assistance to state and local governments for acquiring severely damaged properties in high flood hazard areas;

- Section 73 of the Water Resources Development Act which requires federal agencies to consider nonstructural as well as structural alternatives in flood protection; and

- The supplemental block grants to states to implement nonstructural flood protection programs.

Nevertheless, the federal government continues to subsidize private beachfront development through the Federal Flood Insurance Program, low interest Small Business Administration loans and federal disaster assistance grants. These programs are intended to mitigate the impact of coastal beach losses and storm damages. But at the same time they work at crosspurposes with efforts to move away from coastal flood plain development and so undermine the development of a consistent national policy of peaceful coexistence with shoreline dynamics.

The President's 1977 Executive Orders on flood plain management and wetlands protection suggested an eight step process to guide federal flood plain activities. Agencies were requested to present their plans for compliance with the orders by May 24, 1978.

4.2 State

4.21 Studies - The first known comprehensive study of Maine's coastal beaches for recreation was undertaken in 1934 by the State Planning Board. Since that time a number of studies related to beach recreational use and conservation in Maine have been conducted by or for state level agencies. Tables 3 and 4 summarize these by source.

Additionally, there are several ongoing studies concerned with the sand beaches of the Maine coast. One report on "Shoreline Changes at Popham Beach" is being prepared by Bruce Nelson of the University of Maine's Dept. of Oceanography. A separate atlas of Maine 's major coastal beaches is being completed by Dr. L. Kenneth Fink and Bruce Nelson of the Ira C. Darling Center. The atlas will include management recommendations for all of the beach systems studied.

On March 9, 1978, in the aftermath of a pair of devastating coastal storms, Governor James Longley directed the Committee on Coastal Development and Conservation (CCDC) to address the issue of coastal flood plain management in Maine. The Committee is to prepare by January 1, 1979 a policy report for mitigating coastal flood damages

Table 3

STATE LEVEL STUDIES PERTAINING TO RECREATIONAL USE OF MAINE COASTAL BEACHES

AGENCY	TITLE	YEAR	COMMENT
Maine State Planning Board	"Field Survey of Beaches Kittery to Portland"	1934	First comprehensive survey.
	"Proposed Major Park System in Maine"	1935	In Maine State Planning Board Report; mentions Popham, Old Orchard, Roque Bluffs & Higgins Beaches.
Maine State Legislature	"Report of the Committee on Natural Beauty & Historic Spots"	1933	Recommended the establishment of state parks with salt water frontage.
	"Report of the Recess Committee on Feasibility of Acquiring Property for the Establishment of Public Bathing Beaches..."	1939	Popham, Crescent Beaches proposed as parks.
Maine Development Commission	Postwar Planning for the State of Maine	1944	Popham & Crescent Beach State Park proposals reiterated.
Maine State Park Commission	Preliminary Report of the Maine Park and Recreation Area Study	1940	Popham & Crescent Beach parks proposed.
	Preliminary Report on State Park and Related Recreational Planning	1952	Suggested potential state park sites included Kennebunk Beach region.
	A Recreation Plan for Maine	1956	Proposed beach parks included Crescent Surf, Crescent, Popham Beaches and Roque Island.
Maine State Park & Recreation Commission	Outdoor Recreation in Maine	1965	Prepared by University of Maine.

Maine Bureau of Parks and Recreation	Statewide Comprehensive Outdoor Recreation Plan	1972, 1977	Analyzed supply & demand use of swim facilities.
	"Summary Data Concerning Use at Reid State Park...During August 1970"	1974	Unpublished paper on park user characteristics.
	"Southern Maine Coastal Beach Research-Initial Report"	1975	Unpublished memo documenting beaching facilities.
	"Visitor use Survey: Day Use State Parks and Coastal Municipal Beaches from Portland to Kittery"	1975	Paper on beach and park user characteristics.
	"Coastal Beach Analysis-Kittery to Portland"	1975	Unpublished paper on beaching supply & demand.
	"Recreation in Maine, Utilization and Need"	1976	Use and preference panel survey by Social Science Research Institute.
	"Maine Resident Outdoor Recreation Participation & Preferences"	1977	Use and preference survey by Northeast Markets, Inc.
Maine State Planning Office	Maine, An Appraisal by the People	1973	Preference survey by Northeast Markets, Inc. with questions on beach acquisition.
	Citizen Evaluation of Public Policy in the Coastal Zone	1975	Survey by Social Science Research Institute with questions on beach use and shore acquisition.
Vacation Travel Analysis Committee	Tourism in Maine: Analysis & Recommendations	1974	Included data on economic, social & environmental impacts of beach use.

Table 4

STATE LEVEL STUDIES PERTAINING TO CONSERVATION OF MAINE COASTAL BEACHES

AGENCY	TITLE	YEAR	COMMENT
Maine Geological Survey/Bureau of Geology	"Erosion Studies of Wells and Popham Beaches"	1970	In Marine Erosion Studies on the Sand Beaches of Maine, Progress Report, by B. S. Timson.
	"Observations on the Origin & Development of the Wells Beach Area, Maine"	1970	In Shorter Contributions to Maine Geology, MGS Bull 23, pp. 58-68, by A. M. Hussey.
	"Studies of Processes Controlling Beach Morphology Systems of the Wells Area, Maine"	1971	Open file report by B. S. Timson.
	"Historical Changes of the Webhannet River Inlet, Wells, Maine"	1976	Unpublished report by B. S. Timson and D. Kale.
	A Handbook of Coastal Marine Geologic Environments of the Maine Coast	1977	Draft report by B. S. Timson with 112 maps.
Maine Department of Conservation	Beach Vegetation & Oceanic Processes Study of Popham State Park Beach, Reid State Park Beach, and Small Point Beach	1977	Prepared cooperatively with Time & Tide RC&D by P. Trudeau, et al.
Maine State Planning Office	Maine Shoreline Erosion Inventory	1977	Draft report by the Maine Bureau of Geology.
	Geological & Botanical Features of Sand Beach Systems in Maine	1978	Draft report for the State Critical Areas Program.

with appropriate recommendations for executive, legislative, local and federal cooperation. The State Land and Water Resources Council will conduct the study and transmit the study report to the CCDC.

Three principal research tasks for the study have been outlined: (1) to identify those beaches in severe danger or of critical importance to coastal ecology and to categorize them for policy purposes, (2) to inventory existing legislation related to coastal flooding and determine the legal limits of suggested policy approaches, (3) to investigate the short and long term impacts of alternative policy approaches on the state/local economy.

4.22 Natural and Critical Areas - Over 100 coastal beach features were listed in the 1972 Maine Natural Areas Inventory.[1] The Critical Areas Program of the State Planning Office is currently taking this information one step further by studying Maine's coastal sand beaches for possible registration as State designated Critical Areas. A recently completed report identified thirty beach systems which met specific geological and biological significance criteria as critical areas.[2] Already a number of beach localities have been registered as critical bird nesting habitat for least terns and piping plovers.

Many of these Natural Areas and Critical Areas are vulnerable beach features which are not tolerant to substantial human use and so would best be kept in a protected state.

4.23 Statutes - At least three State agencies have authority to acquire land or regulate activities related to beach recreational use and/or protection. The Bureau of Parks and Recreation is authorized to acquire land "to preserve the natural character and features of such area."[3] As discussed in section 3.1 the Bureau owns a number of significant beaches. These properties are managed for recreational use as well as for the long term conservation of the shorefront resource.

The State Planning Office, as part of the Maine Critical Areas Program, registers highly unusual natural features or outstanding examples of common features.[4] As discussed above several beach sites have been registered or are being studied for potential registration.

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[1] Natural Resources Council of Maine, Maine Natural Areas Inventory, (Augusta, 1972).

[2] Bruce W. Nelson and L. Kenneth Fink, Geological and Botanical Features of Sand Beach Systems in Maine, report prepared for the Maine Critical Areas Program, 1978).

[3] 12 M.R.S.A. § 601-602.

[4] 5 M.R.S.A. § 3310-3314.

The Department of Environmental Protection, under the Oil Discharge Prevention and Pollution Control Law, regulates the loading and transportation of petroleum products along the coast. As part of the program oil spill prevention and clean up is financed by a fee on oil brought into Maine ports. The Legislature, in the findings section of the act, declared it to be the intent of the State to maintain "The coastal waters, estuaries, tidal flats, beaches and public lands adjoining the seacoast, in as close to a pristine condition as possible."[1]

4.24 Policy - As at the federal level, a state policy on shoreland changes appears to be evolving. The State, through the Department of Environmental Protection, still allows some shoreland construction. However, a noteable step was taken when the Board of Environmental Protection recently adopted a policy opposing the construction of new seawalls (see 5.25). That the Governor has directed the Committee on Coastal Development & Conservation to make recommendations on mitigating coastal flood damages also illustrates that the State is beginning to come to grips with the problems of beach development and property loss.

In addition, the State is in the process of finalizing its policy statement on flood hazard mitigation as required by the Federal Diaster Assistance Administration.

4.3 Local

4.31 Studies - There appear to have been few beach recreation or conservation studies undertaken in the past at the local level. Beach morphology has been monitored at Ogunquit Beach the past several years and some work has been done at Pemaquid Beach. However, no comprehensive listing of municipally initiated studies is available.

Currently at least one local beach study is underway in Maine. The city of Kittery, funded by a $7,000 Coastal Zone Management grant, is preparing an environmentally sound management plan for Sea Point Beach and Fort Foster Park. Other projects have been proposed including a multicommunity beach erosion reconnaissance study of the beaches in Saco Bay. Projects such as this are expected to be eligible for funding under the 306 phase of the State's Coastal Program.

4.32 Maintenance - While there have been few studies, many coastal towns have undertaken extensive beach clean-up projects both on public and private beachfronts. The towns of Scarborough, Kennebunk and Old Orchard, for instance, have for years carried out clean up programs, at public expense, intended to improve the resource for recreational use. Ironically while these activities may have enhanced the beaches for recreational use, they may have threatened the conservation of the resource by interfering with the natural dynamics of the beach ecosystem.

[1] 38 M.R.S.A. § 541.

4.33 Policy - By and large, the policy of coastal communities toward beach loss has been to support the building of structures to prevent or mitigate property loss. The justification has been predominantly economic: towns have not wanted to incur property tax losses and the expense of rebuilding public facilities such as shore roads.

This is changing as citizens come to recognize the ultimately futility of shoreline structures. In Camp Ellis voters in June 1978 defeated a bond issue to finance the construction of a revetment proposed for the Saco beaches. Despite the support of city officials the measure lost by a margin of more than four to one. Some Saco beachfront owners have used dune grass planting as an alternative erosion mitigation measure.

While some Popham Beach landowners have fought for the privilege of building seawalls in front of their own properties, others have resigned themselves to loosing their shoreland and in many cases their homes.

At Ogunquit, too, citizens have acted for the conservation of the beach. They have banded together as the Special Committee to Restore the Ogunquit Dunes (SCROD) and other groups to try to force the federal government to remove the dike built on the beach several years ago.

4.4 Private

4.41 Studies - The private sector has been involved in various beach studies over the years, usually in conjunction with publicly funded projects. A partial list follows:

P.E. Raymond and H.C. Stetson, "A Calcareous Beach on the Coast of Maine," Journal of Sed. Petrology, 2, 1932, pp. 51-62.

S.C. Farrell, "Coastal Processes, Historical Changes, and the Post-Pleistocene Geologic Record of Saco Bay, Maine," unpublished Ph.D. dissertation, Coastal Research Center, University of Massachusetts, 1972.

D.C. Koons, "Geomorphology and Land Use Decisions in Maine," Geol. Soc. Amer. Spec. Paper, No. 174, 1976.

M. Hunter, Maine Ecosystems, South Gardiner, Maine: Center for Natural Areas, unpublished, 1976.

4.42 Easements - The private sector has also been involved in beach conservation through the granting of conservation easements. The most important easement to date covers the entire Seawall Beach system between the Sprague and Morse Rivers in Phippsburg.

4.43 Policy - A number of private conservation organizations have urged the establishment of a comprehensive State policy toward the

conservation of sand beaches in Maine. The Natural Resources Council of Maine in March 1978 issued a resolution urging a State policy dealing with seawalls and other developments as well as public education. The Maine Audubon Society took a public stand in April 1978 against the construction or reconstruction of seawalls.

5.0 EVALUATION

Maine's sand beaches form one of the state's most valuable coastal resources since they represent most of the public access, intensive recreational use, open space, and salt marsh boundry portions of the coastline..... Maine's specific and regional beach problems can be attributed to development of a natural resource without an understanding of fundamental beach ecosystem dynamics.

--Bruce W. Nelson and
L. Kenneth Fink,
Geological and Botanical Features of Sand Beach Systems in Maine,
1978

5.0 EVALUATION

5.1 Beaches of State Level Significance

Due to their size, sand texture, history of use (or nonuse), or geographical location certain beaches may be considered to be of state level recreational significance. The majority of these are located southwest of Casco Bay due to the concentration of glacial outwash sediments in that region. On the other hand, there are many beaches, most of them small or not readily accessible and located east of Casco Bay which traditionally have been primarily of local recreational interest. Listed in Table 5 and shown in Figure 1 are those beaches which are regarded as of primary interest. A comprehensive list of coastal sand beaches follows this discussion.

5.2 Proposed Actions

In order to protect and restore Maine's coastal beaches a wide ranging program of land use regulation, federal-state-local cooperation and geologic research may be necessary. The sooner a systematic effort can be initiated to protect both the public and private safety and welfare, the better the chance for success. There are several specific actions which might be undertaken as part of an ecologically sound program to conserve the beach resources in Maine.

5.21 Moritorium - The State might impose an immediate moritorium on all major construction in dunes and beach associated wetlands while some or all of the following actions are implemented. As an interior measure a moritorium could prevent further alteration of beach ecosystems and the investment of money in high risk locations where it is likely that building will be permanently restricted in the near future.

5.22 Amend Laws - As they stand, both the Coastal Wetlands Alteration Act and the Mandatory Shoreland Zoning Law offer some regulation of land use activities in beach ecosystems. However, neither can adequately protect fragile dune areas from development. If permits are to be granted for backbeach development, careful review for long term economic and geologic impacts should be included. The Coastal Wetlands Act could be amended to bring all wetland areas including those subject to periods of maximum storm activity into the permitting process. The beefing up of local shoreland zoning ordinances could also go a long way toward improving beach conservation. Through one or more of these laws all filling of salt, fresh and intertidal marshes in the coastal area could be prohibited.

5.23 Enforcement - At the same time, the enforcement of existing controls over seaside development could be improved by increased technical and financial assistance from the State. Many towns have demonstrated that they are not sincere about enforcing local

Table 5

MAINE COASTAL RECREATIONAL BEACHES OF STATE LEVEL SIGNIFICANCE
(West to East)

	BEACH	MUNICIPALITY	OWNERSHIP	OPEN TO PUBLIC
1	Long Sands	York	Municipal	Yes
2	Short Sands	York	Municipal	Yes
3	Ogunquit	Ogunquit	Municipal	Yes
4	Moody	Wells	Private	Yes
5	Wells	Wells	Private	Yes
6	Drakes Island	Wells	Private	Yes
7	Laudholm	Wells	State/Private	Yes
8	Crescent Surf	Kennebunk	Private	No
9	Parsons	Kennebunk	Private	Limited
10	Goochs	Kennebunk	Municipal	Yes
11	Goose Rocks	Kennebunkport	Private	Limited
12	Fortune Rocks	Biddeford	Private/Mun.	Limited
13	Hills	Biddeford	Private	No
14	Saco Beaches	Saco	Private/State	Limited
15	Old Orchard	Old Orchard Beach	Municipal	Yes
16	Pine Point	Scarborough	Private	Yes
17	Ferry	Scarborough	Municipal	Yes
18	Western	Scarborough	Private	Limited
19	Scarborough	Scarborough	Private/State	Limited
20	Higgins	Scarborough	Private	Yes
21	Crescent	Cape Elizabeth	State	Yes
22	Willard	So. Portland	Municipal	Yes
23	Andrews	Portland	State	Yes (Limited)
24	Little Chebeaque	Portland	State	Yes (Limited)
25	Seawall	Phippsburg	Private	Limited
26	Popham-Hunnewell	Phippsburg	Private/State	Yes
27	Reid	Georgetown	State	Yes
28	Pemaquid	Bristol	Municipal	Yes
29	Lincolnville	Lincolnville	Private/Mun.	Yes
30	Pond Island	-	Private	Yes (Limited)
31	Sand	Bar Harbor	Federal	Yes
32	Sandy River	Jonesport	Private	Limited
33	Roque Island	Jonesport	Private	Yes (Limited)
34	Roque Bluffs	Roque Bluffs	State	Yes

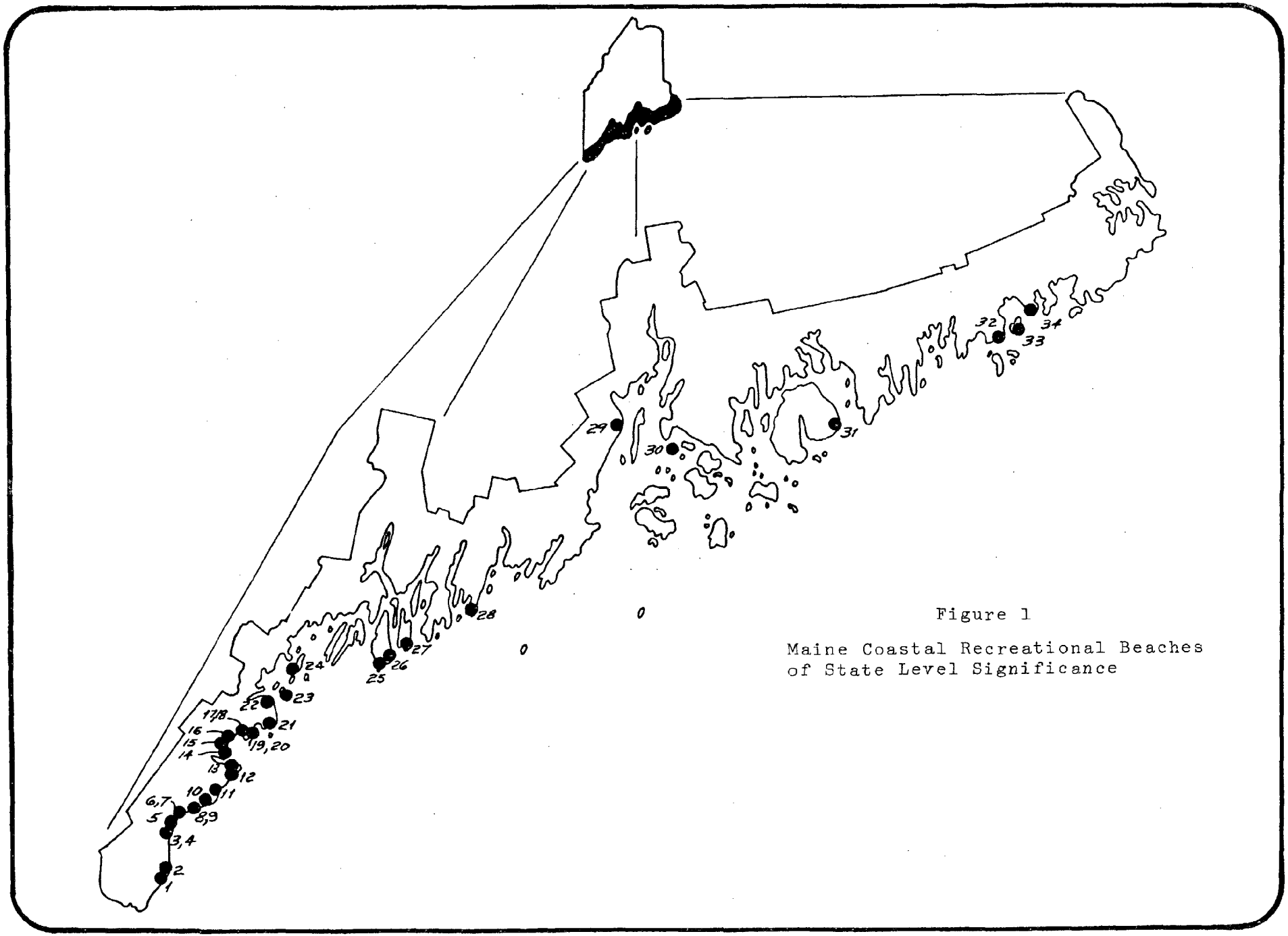

Figure 1

Maine Coastal Recreational Beaches
of State Level Significance

shoreland zoning ordinances. Others simply cannot handle the task. As a result, building continues on the beaches. Development, particularly in those few beach areas which in recent years have been accreting, should be prohibited and a strict setback could be established for all new seaside structures, including public beach facilities.

5.24 Program Review - A comprehensive review of local, state and federal laws and regulations dealing with shoreline erosion and coastal floodplain management in Maine could be undertaken. A web of laws and regulations has evolved in recent years dealing with coastal erosion and flooding. At least four state agencies and five federal agencies have a direct interest in these issues. Additionally, a number of private sector industry and conservation organizations are affected by the laws concerning flooding and erosion on the coast. All of these interrelationships should be spelled out. Such a review should include an evaluation of the objectives (to see where they are at crosspurposes), the administration, the enforcement of existing laws and recommendations to streamline the bureaucratic process of mitigating shoreline losses. The work suggested here would help satisfy federal requirements of the Coastal Zone Management Act Amendments of 1976.

5.25 Seawalls - Time and again geologists have stated and experience has shown that the development and construction of seawalls on beach environments results in accelerated erosion of the beach and degradation of the beach as a recreational resource as well as the destruction of structures built on the beach. Under certain conditions where existing investments warrant structural methods (e.g., breakwaters, seawalls and revetments) may be the only effective means of shoreline protection. Nonetheless, nonstructural methods, such as the use of vegetation as a sediment trap, are preferred over structural methods. They are normally less costly and more harmonious with natural beach processes than structural methods. Most important, nonstructural measures are designed to prevent people from occupying floodplains, to mitigate existing problems of floodplain occupation and to maintain the beneficial values of floodplains.

That seawalls are a significant intrusion on beach systems was recognized by the Board of Environmental Protection when in May 1978, it approved a policy that hereafter it will normally be unable to make the necessary favorable findings of fact set forth in the Alterations of Coastal Wetlands Law, when an application is made for new seawalls on sand beaches. By emphasizing the burden of proof on applicants the Board has clearly acknowledged that the construction of seawalls causes "significant modification to normal patterns of water movement and the erosion and accretion of sand." When they acquired property on the beach, private owners simultaneously assumed the risk which goes with coastal land ownership.

The Board of Environmental Protection could go one step further and require that seawall reconstruction permit applications be reviewed on a case by case basis. Reconstruction of storm damaged seawalls would be permitted only when substantial evidence can be presented that the seawall will not significantly interfere with the

natural processes of the beach system and the long term heath of the beach.

5.26 Acquisition and Relocation - In some areas it is possible, at least for the short term, to mitigate property loses due to coastal erosion. However, development simply should not be allowed on some sites. Two actions could help in such cases: (1) the Legislature could establish a fund to finance State or municipal acquisition of those beach areas prone to chronic and acute erosion; and (2) rather than being encouraged by government incentive programs to build or rebuild in flood hazard areas, people could be financially encouraged to build/rebuild, instead, away from the ocean's reach.

It has been demonstrated that many aspects of the National Flood Insurance Program are oriented toward the problems of riverine flooding and are not well suited to coastal flooding. In fact, financing acts as a strong counterforce to flood plain management efforts, and so to the professed goals of the National Flood Insurance Program. Projected flood insurance claim payouts for the February 1978 storm which struck southern coastal Maine are projected to reach $8-10,000 per claim.[1] Many shore residents have indicated that the willingness to rebuild stems in large part from the availability of federal insurance.

Besides flood insurance there are a number of federal programs which act as disincentives to relocation out of coastal flood hazard areas, including Small Business Administration disaster loans, federal repair grants and storm repair grants for elderly homeowners. The administration of these programs could be changed to allow relocation or reconstruction aid only once for each property. Structures not yet built would be eligible for no aid if damaged by future storms or shore erosion.

Until the State has an equitable policy allowing some monetary consideration for landowners who are not allowed to build/rebuild where destruction is a certainty, the public will continue to bear the dual costs of governmental insurance and loan subsidies and the degradation of an irreplaceable resource of public significance. Acquisition of highly erosional beach areas and adjacent upland buffer zones could in many cases serve to provide areas for public recreation and coastal public access where facilities to service these uses could be provided.

5.27 Open Beaches Act and Public Rights of Way - In addition to expanding publicly owned beach property, the Legislature could pass an act to expand the rights of the public in the intertidal zone of the shore. The extension of private ownership of most coastal beaches in Maine to low tide is beginning to cause some

[1] New England River Basins Commission, "Coastal Flooding: A New England Perspective on The Great Blizzard of 1978," Regional Report, 6, No. 1 (June 1978), p.2.

real problems in beach use and management. The clarification of the public's right of lateral access for recreation on the beach at least below high tide could eliminate future questions as to permitted coastal public uses. It could also (1) streamline efforts to restore those beaches which experience severe degradation, (2) bring shoreland ownership more into line with the real estate statutes of most other states, (3) help legitimize local beach maintenance expenditures, and (4) clarify eligibility for federal beach protection funds and allow the expanded use of federal Coastal Zone Management monies for public access improvement.

Several states and territories have enacted open shoreline legislation, including Texas, Oregon, the Virgin Islands. In Maine, in 1974, a legislative committee studying public access to lakes and other bodies of water recommended to the Legislative Council that the possibility of adopting a law defining and expanding the public right of access to ocean beaches between high tide and low tide receive further study.

To improve beach access, an open beaches act could be combined with a program of identifying, acquiring, marking and developing public rights of way to the beachface.

5.28 Critical Area Registration - As has been shown here, beach systems are important for a variety of reasons, including the fact that they act as a natural barrier between the ocean and the upland. Maine's undisturbed coastal beaches support many species of unusual flora and fauna. The State could formally recognize the value of our remaining undeveloped beach systems. Inclusion on the State's Registry of Critical Areas would be acknowledgement of the significance of these beaches.

Beach experts at the University of Maine are studying the major undeveloped sand beach systems to suggest geological management recommendations for each beach. When this work is completed, it should be carefully evaluated for implementation.

5.29 Education Program - One of the most prevalent causes of shore losses in Maine has been public ignorance of fundamental natural processes. To heighten public awareness of the geological, botanical, recreational and economic values of Maine's coastal sand beaches an educational program should be mounted. The Maine Audubon Society has announced its intention to organize such an effort. The Natural Resources Council has said it will participate in a public education program. These organizations should receive the support and assistance of the University of Maine, the Department of Environmental Protection, the Department of Conservation and other interested parties. Any educational program should educate the public of the consequences of building on coastal beaches. In particular, methods for limiting the impact of seawalls on beach geology should be stressed.

5.30 Offroad Vehicles - Unlike many states the use of offroad vehicles on coastal beaches in Maine has been minimal. However,

where vehicular traffic has occurred in East coast beach systems, other than on the beachface itself, the results have been devastating. The threat of these machines on dunes and wetlands looms except on those publicly owned beaches where they are expressly prohibited.

5.31 Research - While many of the problems faced with respect to beach use, flooding, erosion, and conservation are clear enough, solutions are not always as obvious. Lack of information should not preclude many immediate actions which can be taken to preserve future options. Still, there are a number of studies which could be undertaken to provide data for better management of each of Maine's coastal beaches.

Geologic research could be stepped up to provide more data on the formation and dynamics of Maine's coastal beach ststems. A monitoring program could be developed to ascertain the vitality of each beach, to quantify those forces causing erosion and to identify potential detrimental impacts resulting from human activity on the beach. The short and long term geologic effects of existing jetties, seawalls and dredging projects on the sand beaches of the Maine coast could also be studied.

Data collection could be stepped up on base flood elevations, in particular the identification of 100 year flood levels. A number of state and federal programs are based on this information, yet only limited data are available to towns to determine flood levels and designations are often arbitrary. Maine shoreland zoning regulations require that the "first floor elevation or openings of all buildings and structures shall be elevated at least two feet above the elevation of the 100 year flood, flood of record, or in the absence of these, the flood as defined by soil types identified as recent flood plain soils."[1] Similarly, the National Flood Insurance Program requires that towns "reasonably utilize any base flood elevation data available from Federal, State, or other source, until such data has been provided by the Federal Insurance Administration, as criteria for requiring that all new construction and substantial improvements meet the following standards: (1) that residential structures have the lowest floor (including basement) elevated one foot above the base flood level, and (2) that non-residential structures have the lowest floor (including basement) elevated or floodproofed one foot above the base flood level."[2]

[1] State of Maine Guidelines for Municipal Shoreland Zoning Ordinances (adopted by the Board of Environmental Protection & the Land Use Regulation Commission, December 15, 1973), Sec. 11, M2.

[2] Office of Civil Emergency Preparedness, Model Ordinance Relating to Flood Hazard Areas (drafted pursuant to National Flood Insurance Act of 1968 (P.L. 90-448 as amended), April 1978).

Other research might focus on (1) recreational carrying capacity based on the amount of use that can take place without significant deterioration of the site or the experience of the visitor, (2) designation of beach associated estuaries as National Estuarine Sanctuaries as among other things, one means of helping to protect beaches, and (3) precise legal ownership of each beach.

Houses were lifted and shifted, piers were floated away, and ground floors of waterfront homes were ankle-deep in water that weathered the February, 1972 tide respectively unshifted, unfloated, and uncovered. Parts of roads were under water that had never been in that perspective before.

--News item, York County Coast Star, January 11, 1978

6.0 SOUTHERN BEACHES

Because of the importance of the beaches on the southwest coast these will be treated here apart from beaches on the rest of the coast.

6.1 Ownership and Access

Many of the beaches in southern Maine are in public ownership. Others, though privately owned, have long been open to public recreational use. Four coastal beach parcels held by the Bureau of Parks and Recreation (Laudholm, Ferry, Scarborough, Crescent) offer approximately 7,807 feet (2,342m) of sandy shoreline - roughly 5% of the total beach frontage south of Casco Bay.

Some beaches, though municipally owned, are in effect largely unavailable for general recreational use because of the lack of adequate convenient access and nearby parking facilities. Local regulations, notably restrictive parking ordinances, further limit beach use by the general public in some towns. Parking at municipal beaches in Kennebunk, for instance, is limited to those permanent and seasonal residents of Kennebunk, Kennebunkport, and Arundel with parking permits. In Wells and Ogunquit, parking is banned on all town roads adjacent to the local public beaches. In Kittery, residents are admitted to the beaches at Fort Foster for a nominal seasonal fee while nonresidents are charged daily.

There are no recreationally significant federal sand beach areas in the region Kittery to Casco Bay, though there are several beach associated wetlands under federal jurisdiction.

6.2 Visitation

The need for increased beach opportunities in southern coastal Maine is a difficult measure to document. The 1977 Maine Comprehensive Outdoor Recreation Plan indicated that while there were no calculated needs for swimming resources in the Southern Planning District, there were some minor needs in the Cumberland District. From the statistical methods utilized in SCORP it was found that a single beach in southern Maine, Old Orchard, was being used close to maximum resource capacity based on a standard of two feet of beach shoreline per person. One study conducted during the summer of 1975 suggested that out of staters accounted for an average of two-thirds of the visitors to coastal municipal beaches. The percentage of out of staters generally declined the further north of Kittery the beach was located.

A different measure - visitation at coastal beach state parks - suggested that pressures for beach use may be growing even faster than might otherwise be suspected. For example, over the past decade the number of annual visits has increased about 50% at Crescent Beach. At Scarborough Beach, visitation rose from approximately 30,000 in 1972 to over 73,000 in 1976. Recent studies of coastal state parks have estimated nonresident use of the parks in York and Cumberland Counties (Table 6).

Table 6

NONRESIDENT VISITATION OF SELECTED DAY USE STATE PARKS

State Park	% Nonresident Parties 1975	1977
Scarborough Beach	24	19
Crescent Beach	17	33
Two Lights	26	49
Wolf Neck	22	49

Source: Maine Bureau of Parks and Recreation, 1977 Visitor Use Survey: Day Use State Parks and 1975 Visitor Use Survey, Day Use State Parks and Coastal Municipal Beaches.

Both the proportion and number of out of state state park visitors appear to have been on the increase in recent years.

In brief, there generally appears to have been an increase in coastal beach use, particularly in southern Maine, in recent years. More and more out of staters are flocking to the beaches[1] (though nonresident use of nonbeach day use state parks appears to be increasing even more rapidly). This coupled with increased beach visitation by young in-migrants points to growing pressures for expanding beaching opportunities. Recent public opinion surveys suggest that the State should be involved helping to meet these needs.

6.3 Facilities

Early in 1975, a survey of all major coastal beaches from Kittery to Portland was completed by the Bureau of Parks and Recreation. Information was collected on beach length, available day use parking capacities, existing public access and sanitary facilities.

[1] Nonresident use of coastal state park beaches has generally been increasing in recent years. As suggested in Table 2, Scarborough Beach may be the exception. However, it should be noted that Scarborough Beach is a relatively new park known predominantly to local residents. Also, of all beach parks sampled in 1977, Scarborough had by far the lowest sample population.

Most of this is presented in summary form as an appendix exhibit. Generally, parking capacities and access from nearby public roads were judged to be adequate while sanitary facilities were deemed insufficient and unappealing. Although there undoubtedly is some outdated and inaccurate information in the survey, it is the most complete available.

6.4 Evaluation

In southern Maine where beach use has traditionally been heaviest there are several possible courses of action for making the beaches more readily available for general public recreation. The State could, for example, pursue acquisition of those beaches still outside the public domain. The only beaches which are not heavily developed and are likely to offer significant potential for public recreation are Crescent Surf, Parson's and Scarborough Beaches.

While public use is not encouraged at Crescent Surf, the public is allowed to use Parson's Beach in Kennebunk. Parking here is the factor limiting use. Parking accommodations could be improved though it is unlikely the present owners would tolerate use above current levels. Since acquisition of Crescent Surf and Parson's Beaches would likely be very expensive and since the beaches are immediately north of Laudholm which will be developed to allow swimming, it may be best to let them remain in private ownership. The Bureau of Parks and Recreation or the town might pursue an easement on Parson's Beach guaranteeing public use at a specified level. In addition, though a small section of the wetland area bordering Back Creek behind Parson's Beach has already been marked for inclusion within the Rachael Carson National Wildlife Refuge, to protect the whole beach-wetland ecosystem the entire vulnerable Back Creek marsh area should be included within the Refuge if the area becomes threatened.

Scarborough Beach is both a significant natural and an interesting historic site as well as an important recreational resource. The beach itself is one of the largest, little developed beach-dune systems remaining in southern Maine. It is popular with those seeking an uncrowded beaching experience, particularly in the nonpeak hours and season. That is not to say the Bureau's property at Scarborough Beach is not often used to capacity. Between 1972 and 1976, yearly public use of the park increased nearly two and one-half fold to more than 73,000 visits. On sunny summer days, the 300 car parking lot commonly fills very quickly and people spill over the boundaries of the Bureau's 67 feet of beach frontage.

Nearby the Bureau's property is the site of a 17th century fortification built by one Captain Joshua Scottow of Boston in 1681 following the First Indian War of 1675. The fort provided a haven for settlers in times of peril during the Indian Wars of the 1600-1700's, though on at least one occasion it was captured by the Indians. During the First and Second Indian Wars, few towns in New England suffered as many deaths as Scarborough.

Nine-tenths of the settlers killed lived at the colony established at Black Point on Scarborough Beach. Perhaps that is the derivation of the name of Massacre Pond.

Today most of the beach is held in a single collective ownership. The Bureau of Parks and Recreation has made offers to purchase additional beach land but has been unsuccessful. Nevertheless, Scarborough Beach is of such significance that it ought to be the explicit intention of the State to acquire more land for expanded public use, including the establishment of an interpretive trail network in the pond-dune area backing up the beach. If more property is acquired at the beach, the Bureau (1) could remove the existing road and parking lot near the beach itself, limiting all parking to lots by the road, (2) should protect the plant associations in the dunes which are uncommon in Maine (e.g. earth star puffball, wormwood, beach heather, pitch pine) and (3) maintain existing facilities for low intensity public beaching use. High intensity beaching can be accommodated at nearby Crescent Beach State Park.

The Bureau of Parks and Recreation could also work with each of the towns to improve facilities such as restrooms and change houses at all of the principal beaches in southern Maine. The large popular tourist beaches are a resource of state level significance. The State would be justified in making grants to communities for beach maintenance and long-term protection. To solve the traffic dilemma, expanded public (e.g. minibus) and bicycle transportation should be explored as an alternative to additional nearbeach parking lots. Wells, York, Kennebunk, and Old Orchard have been trying for years to cope with traffic congestion. All improvements expanding public use should be consistent with natural carrying capacities limiting the amount of use which can take place without significant deterioration of the site or the experience of the visitor. In fact, a spectrum of carrying capacities could be established for the major recreational beaches open to the public with some available for high and some for low intensity use.

Additionally, the Bureau of Parks and Recreation could develop Laudholm Beach as part of a day use state park. The beach could serve as a low intensity use area in a region of crowded, high intensity use beaches. Mitigation of erosion may be necessary as the beach has recently been eroding at an accelerated rate, aggravated apparently by the jetties at Wells Harbor.[1]

[1] "Several property owners in the vicinity of the jetties have benefited with the addition of land (sand accretion) to their deeded holdings of 1962. Unfortunately, their gain is at the expense of increased degredation of the recreational beach and erosion of property owned by the State on the northern tip of Drake's Island." Barry S. Timson and Donald Kale, Maine Shoreline Erosion Inventory (draft report prepared for the Maine State Planning Office, 1977), p. 77.

The mile-long beach is always a special joy for children and dogs and for beachcombers of all ages; and there's some shelter from the biting northerlies if you hug the dunes. As if the scenery itself were not enough, there's usually some activity at sea to reward the rugged who climb the headland--a fishing vessel wallowing in the seas off Sequin, inward bound for the Kennebec, a lobsterman hauling in Sheepscot Bay, a tanker hard down on the horizon.

--News item, "Winter Beach",
Brunswick Times Record,
February 7, 1977

7.0 NORTHERN BEACHES

7.1 Ownership

Northeast of Cape Elizabeth, several of the major sand beaches are already in public ownership. The Bureau of Parks and Recreation holds seven beaches with a total of approximately 25,330 feet (7,720 m) of sandy shore frontage. This is about ten percent of the total beach shoreline. In addition to several small, locally important beaches, Pemaquid Beach is municipally owned. Sand Beach in Bar Harbor is managed as part of Acadia National Park.

Unlike southern Maine, there are a number of fine sandy beaches located on some of the offshore islands along this stretch of the coast. Long and Little Chebeague Islands in Casco Bay, Pleasant and Marshall Islands in Jericho Bay, and Roque Island in Englishman Bay all have particularly good beaches.

7.2 Visitation

According to the 1977 Maine Comprehensive Outdoor Recreation Plan there are only modest needs for beaching areas along this part of the coast. In the Mid-coast District, there are presently some calculated needs. In the Eastern District there are only minor calculated deficiencies beginning around 1990.

The two major beach state parks, Popham and Reid, have shown heavy use in recent years. Reid is the most heavily used day use park in the state. Two hundred thousand beachgoers visit Reid each year. At Popham visitation trippled between 1968 and 1976. More than 110,000 day trippers now visit Popham annually. Results of a 1977 survey indicate nonresident parties to Reid comprise 38% of the total. Nonresident parties to Popham Beach State Park make up 49% of the total.

7.3 Facilities

No information has been compiled on beach facilities Downeast, but there is little to compile. Parking lots, change houses and lifeguards are provided at Popham, Reid and Roque Bluffs State Parks. In addition, refreshments are available at Reid.

Parking is accommodated at a couple of other beaches but there are few, if any, other formal facilities provided.

7.4 Evaluation

The problems of the Downeast beaches are much different from those in southern Maine. The local beaches in this region tend to be short, narrow pocket beaches. These serve as recreation areas (usually more for sunning than swimming due to the cold water temperatures) for local permanent and seasonal residents. Unlike

the southern beaches, most of these small beaches are little used by transient tourists and suffer few congestion problems.

Already several of the large beaches of recreational importance east of Casco Bay are in public ownership. Of these, the beaches of Popham Beach and Reid State Parks were the subject of a recently completed botanical-geological study. Ten specific management recommendations have been proposed by Philip Trudeau, et al in the report Beach Vegetation and Oceanic Processes Study of Popham State Park Beach, Reid State Park Beach, and Small Point Beach. These management suggestions deal with fences, picnic areas, planting and fertilizing, boardwalks, foredunes, park accessibility, beach erosion, beach nurishment, park enlargement, education, and other problems. Similar management studies could be undertaken for other beach parks owned by the Bureau including Ferry Beach, Scarborough Beach, Roque Bluffs, Laudholm, Little Chebeague, Andrews Beach and Birch Point Beach.

There are only a few large privately owned beaches east of Casco Bay which offer potential for significant public recreation: the beaches on Hermit Island and Cape Small in Phippsburg, the sections of beach on the Popham peninsula not in State ownership, Sandy River Beach in Jonesport, and the beaches on Roque Island off Jonesboro. Another, Seawall Beach (aka Morse, St. John, Small Point, Long Beach) in Phippsburg, is now protected by a conservation easement granted to The Nature Conservancy. It is available for scientific and educational use and low intensity recreation use.

The beaches on Hermit Island and Cape Small are for the most part not very large. However, acquired in conjunction with adjacent upland areas and tied into the nearby Popham Beach area, they could be a major recreational resource.

Although only a portion of Popham Beach in Phippsburg is owned by the State, as park use has grown more and more visitors spill out onto the private beach area. This same private property has been the section of the beach most seriously subject to beach erosion in recent years. Because of the natural and historical importance of the entire Popham peninsula it would be appropriate for the State to begin action for the protection of the entire beach by eventual acquisition or other means.

Already Sandy River Beach on Chandler Bay in Jonesport is used as a local beaching area. Several homes back a portion of the beach. The most urgent need is for offroad parking space to keep people from driving onto the sand dunes.

The beaches on Roque Island have been, at once, long recognized for their unique natural beauty and yet little known save by local residents and cruising enthusiasts. Under continuous ownership by one family for the past century, they have traditionally been open to all. These beaches appear to be both well managed and available under present ownership.

8.0 SUMMARY OF RECOMMENDATIONS

Gov. James B. Longley...called on tourists Monday "to treat...our beaches as they would their own living rooms," in his holiday message.

--News item
Bangor Daily News,
July 4, 1978

8.0 SUMMARY OF RECOMMENDATIONS

Coastal sand beaches in Maine are, for all practical purposes, a natural resource in finite, fixed and hence scarce supply. They are also irregularly distributed, some communities having expansive stretches of sandy beach while others have none. Equally unevenly distributed are the users of the resource: seasonal and permanent local residents, day trippers from inland cities and towns, tourists from out of state. Clearly the importance and problems associated with many beaches transcend local boundaries; so too must the responsibility to deal with them.

Many actions can be taken by municipalities to protect the economic interest and beach resources of a community. However, often the latter is sacrificed to the former. Where towns are willing to work within the long term constraints of protecting the beaches State-local cooperation is most practical. However, this brief discussion cannot deal with the specifics of each local situation. It can only suggest broad actions for protecting the longer public interest.

Based on the information gathered for this paper and the report The Maine Coast: Recreation and Open Space, it is recommended that the following State and local actions be considered.

8.1 Program Recommendations

Recommendation	Suggested Agent
1. Impose a moritorium on major construction on all coastal sand beach systems, including dunes, beach associated wetlands and accretionary beach areas as an interim measure during which some or all of the following are implemented. (Work directly related to the management of public beach systems such as walks, traffic control fencing, etc. could be allowed after permit review by the Department of Environmental Protection).	Legislature
2. Amend the Coastal Wetlands Act to bring beach dunes and associated wetlands not covered by shoreland zoning into the permitting process administered by the Department of Environmental Protection.	Legislature
3. Review, and amend where necessary, local shoreland zoning ordinances to prohibit or regulate development on nontolerant beach system areas.	SPO, DEP, LURC, Towns

Recommendation	Suggested Agent
4. Increase State technical and financial assistance to improve the enforcement of existing local land use regulations (shoreland zoning ordinances, plumbing codes, building codes, etc.) over seaside development.	DEP, DHS, LURC, etc.
5. Undertake a comprehensive review of local, State and federal statutes dealing with shoreline erosion and coastal flood plain management.	SPO, AG
6. Establish a uniform minimum shoreline setback for all new structures, except those whose function depends directly on seaside location.	Legislature
7. Review all seawall reconstruction projects on a case by case basis and restrict reconstruction where it can be reasonably demonstrated that a wall will significantly interfere with the natural processes of the particular beach system.	BEP
8. Authorize acquisition of designated beach areas prone to chronic and acute erosion and establish a fund to finance such State or municipal acquisition.	Legislature
9. Provide reconstruction aid for storm damages one time to private property owners located in coastal flood hazard areas.	Federal
10. Clarify public recreational rights in coastal intertidal areas by enactment of open beaches type legislation.	Legislature
11. Identify, and where appropriate, open and mark existing public rights of way to the shore.	Towns
12. Acquire, mark, and develop additional public rights of way to the beach face where carrying capacities will not be exceeded	BPR, Towns
13. Register as critical areas and prohibit all development on unique or especially valuable natural beach areas or wildlife habitats.	SPO, Legislature
14. Protect the remaining major undeveloped coastal beach systems by implementing the management recommendations of the coastal beach atlas being prepared by researchers at the University of Maine.	BPR, Towns, Private landowners

Recommendation	Suggested Agent
15. Organize an education program to improve public awareness of the value and the processes of coastal beach systems and the effects of building on the beach.	SPO, MAS, NRC, BPR, DEP
16. Prohibit offroad vehicular use of all beach areas.	Legislature
17. Expand public service radio reports of swimming conditions (tides, temperatures), traffic and crowds at State park beaches.	BPR
18. Study the geologic effects of existing jetties, seawalls, and dredging projects on coastal sand beaches to assess the benefits of each structure in relation to the damaging effects and make detailed recommendations.	BOG, ACE
19. Step up data collection on base flood levels.	Federal
20. Determine beach recreational carrying capacities for each coastal State managed beach.	BPR
21. Study beach associated estuaries for possible designation as National Estuarine Sanctuaries.	SPO
22. Research precise legal ownership of all coastal sand beaches.	Towns
23. Provide financial and technical assistance to municipalities with beaches of state level recreational significance to improve restrooms, change houses, and ecologically sound beach maintenance.	BPR
24. Encourage public and bicycle transportation for the heavily used southern coastal beaches as an alternative to the construction of additional nearbeach parking areas.	BPR
25. Provide a readily available and well advertised source of beach grass to beach property owners and technical assistance in planting and maintaining the grass as a natural method of dune stabilization where appropriate.	SCS
8.2 Site Recommendations	
26. Pursue an easement or agreement on Parson's Beach guaranteeing public use at a specified level.	BPR or Town

Recommendation	Suggested Agent
27. Continue management of Crescent Beach State Park and Reid State Park principally as beaching-picnicking State park facilities.	BPR
28. Develop Laudholm Beach and Little Chebeague Island as multiple attraction State Parks.	BPR
29. Develop minimal facilities (e.g. toilets, snow fences) to protect Andrews Beach from recreational abuse.	BPR
30. Develop Birch Point Beach to be operated by a local or regional agency as a regional park.	BPR
31. Implement the recommendations of Philip Trudeau's study of the Popham Beach and Reid State Park systems where practical.	BPR
32. Undertake management studies, similar to that done for Popham Beach and Reid State Parks, for major coastal beaches held by the Bureau of Parks and Recreation.	BPR
33. Acquire additional beachfront and backdune land at Scarborough Beach.	BPR
34. Consider acquisition by the Bureau of Parks and Recreation of property at East Cundy Point including the beaches at the site.	BPR
35. Study conservation and recreation of the Cape Small-Hermit Island beaches.	BPR
36. Establish a Popham Trust to protect the natural, cultural and historic resources of the entire Popham peninsula, including all of the sand beaches between the Morse and Kennebec Rivers.	BPR, Town
37. Assure long term protection of the beaches at Ram Island Farm in Cape Elizabeth and Roque Island in Jonesboro.	BPR, Owners, SPO
38. Construct parking areas to keep traffic off the backbeach at Sandy River Beach.	DOT

KEY

ACE = Army Corps of Engineers
AG = Office of Attorney General
BEP = Board of Environmental Protection
BOG = Bureau of Geology
BPR = Bureau of Parks & Recreation
DEP = Dept. of Environmental Protection
DHS = Dept. of Human Services
DOT = Dept. of Transportation
LURC = Land Use Regulation Commission
MAS = Maine Audubon Society
NRC = Natural Resources Council
SCS = Soil Conservation Service
SPO = State Planning Office

9.0 REFERENCES

9.0 REFERENCES

Austin, Phyllis. "Beach Erosion", Maine Times (June 16, 1978).

_____. "Unless the Seawalls Are Torn Down, the Sand Beaches May Disappear", Maine Times (April 7, 1978).

_____. "The Beaches Are Sinking", Maine Times (August 13, 1976).

Bryfonski, Dedria. The New England Beach Book. New York: Walker and Company, 1975.

Creteau, Paul G. Principles of Real Estate Law. Portland, Maine: Castle Publishing Company, 1977.

Dammann, Peter A. "Spring is Here, Building on the beach is booming, And the taxpayers are footting the bill," Maine Times (May 19, 1978).

Ducsik, Dennis W. Shoreline for the Public. Cambridge: The MIT Press, 1974.

Fefer, Stewart I., et al. "Marine Intertidal Beach," An Ecological Characterization of Maine's Coast North and East of Cape Elizabeth. Draft report submitted by Energy Resources Co. Inc. to U.S. Fish and Wildlife Service. Cambridge, MA: March, 1978, pp. IV-251-269.

Fink, L.K. "Considerations for Determining the Carrying Capacity of Maine's Coastal Beaches for Recreational Use." Unpublished, March, 1977.

Henry, Harriet P., et al. Maine Law Affecting Marine Resources. Prepared under the joint sponsorship of the School of Law of the University of Maine and the National Science Foundation, 1969-70.

_____. Coastal Zone Management: A Legal Perspective. Prepared for the State Planning Office. Augusta, December, 1973.

Hunter, Malcolm L. Maine Ecosystems. South Gardiner, Maine: Center for Natural Areas, August, 1976.

Jagschitz, John A. and Robert C. Wakefield. How to Build and Save Beaches and Dunes. Kingston: University of Rhode Island, 1971.

Klock, Thomas (ed.) The Ocean's Reach: Identifying the Extent of Coastal Flood Hazard Areas and Associated Risk Zones. New England River Basins Commission, 1976.

Maine Audubon Society. Seawall Policy. Approved April 5, 1978.

Maine Bureau of Parks and Recreation. "1977 State Park Day Use Survey." Unpublished. Augusta, May, 1978.

_____. "Maine Resident Outdoor Recreation Participation and Preferences Survey." Augusta, April, 1977.

_____. Maine Comprehensive Outdoor Recreation Plan. Augusta, March, 1977.

_____. "1975 Visitor Use Survey: Day Use State Parks and Coastal Municipal Beaches from Portland to Kittery." Augusta, September 1975.

_____. "1975 Coastal Beach Analyses - Kittery to Portland." Unpublished. Augusta, May 1975.

_____. "Southern Coastal Research-Initial Report". Unpublished memorandum by B.L. Walker. Augusta, April 15, 1975.

Maine Department of Environmental Protection. "New Policy on Seawalls Outlined," Maine Environnews, IV, No. 19 (June 1978).

McHarg, Ian L. Design With Nature. New York: Doubleday, 1969.

Natural Resources Council of Maine. Maine Natural Areas Inventory. Augusta, 1972.

_____. Resolution Re: The Need for a Comprehensive State Policy Regarding Protection of the State's Sand Beaches. Approved March 10, 1978.

Nelson, B.W. and L.K. Fink, Jr. Geological and Botanical Features of Sand Beach Systems in Maine. Prepared for the Maine Critical Areas Program, 1978.

New England River Basins Commission. "Coastal Flooding: A New England Perspective on the Great Blizzard of 1978," Regional Report, 6, No. 1 (June 1978).

_____. Regional Policy Statement on Flood Plain Management in New England. Boston, June 1978.

Northeast Markets, Inc., Arthur D. Little, Inc., and William R. Fothergille. Tourism in Maine: Analysis and Recommendations. Report to Maine Vacation Travel Analysis Committee, 1974.

_____. Maine, An Appraisal by the People. Prepared for the Maine State Planning Office, September, 1973.

Office of Civil Emergency Preparedness. "Model Ordinance Relating to Flood Hazard Areas." Drafted pursuant to National Flood Insurance Act of 1976 (P.L. 90-448 as amended), April, 1978.

Olsen, Stephen B. and Malcolm J. Grant. Rhode Island's Barrier Beaches. Kingston: Coastal Resources Center, 1973.

Reed and D'Andrea. Conservation Priorities Plan of the Coast of Maine. South Gardiner, Maine. Prepared under the auspices of the Smithsonian Institution's Center for Natural Areas, September, 1973.

Smith, M.M. Protecting Your Coastal Wetlands. Prepared for the Maine Department of Environmental Protection. Augusta, 1974.

Social Science Research Institute. Citizen Evaluation of Public Policy in the Coastal Zone. Prepared for the Maine State Planning Office, May 1975.

State of Maine Guidelines for Municipal Shoreland Zoning Ordinances. Adopted by the Board of Environmental Protection and the Land Use Regulation Commission, December 15, 1973.

Timson, Barry and Donald Kale. Maine Shoreline Erosion Inventory. Unpublished. Prepared for the Maine State Planning Office, 1977.

Tippie, Virginia K. (ed.) Shoreline Erosion in Rhode Island. University of Rhode Island, 1977.

Trudeau, Philip, Paul J. Godfrey and Barry S. Timson. Beach Vegetation and Oceanic Processes Study of Popham State Park Beach, Reid State Park Beach, and Small Point Beach. Prepared under cooperative agreement between Maine Department of Conservation and Soil Conservation Service-USDA as a project of Time and Tide Resource Conservation and Development Area. September 1977.

U.S. Army Corps of Engineers. National Shoreline Study, North Atlantic Region. Washington, D.C., 1971.

U.S. Congress, House of Representatives. Report No. 94-878. 94th Congress, 2nd session, March 4, 1976.

York County Coast Star. Various news items (January 1975 - June 1978).

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