

# MAINE STATE LEGISLATURE

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Report of the Environmental Subgroup  
to The Commission on Maine's Future  
November 1, 1976

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REPORT OF THE ENVIRONMENTAL  
SUBCOMMITTEE

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I. Introduction

A. General Description of Maine

More than most states in this country, Maine has remained physically unchanged by the economic and population growth that has transformed the landscape of so many other states. The pace of Maine life is slower, contact with nature closer, and the importance of the individual clearer than is the case elsewhere in our highly structured, complex industrial society. For many people, Maine represents the qualities and values of American life that have been lost in the rush of the larger society to vindicate its belief that "more is better."

As a geographical entity, Maine is perceived by residents and visitors alike as having special physical qualities that make it distinctive. This thirty-three thousand square mile area in the northeastern United States is an unusual combination of mountains, lakes, fields, forests, and rocky coastline. Geography, topography, and climate can be described scientifically, but it is their relationship with one another as perceived by man in the late twentieth century that makes Maine "different."

Maine is a microcosm of the world, and what is true with regard to the improvement of the world's environment is true for Maine. Citizens have some advantage at the moment in Maine, but there is no room for complacency. Maine has become a precious national resource. A large segment of American society has gradually come to recognize that the pursuit of "more" is at, or past, the point of diminishing returns.

This fact has been driven home by rapid exhaustion of domestic supplies of critical industrial raw materials, by the pollution of air and water, by the impersonality of an industrial society, and by a host of other problems associated with it. As a nation we are trying belatedly to correct the mistakes of haphazard response to the demands of population growth, increasing consumption patterns and industrial growth. In too many instances, past decisions--or the lack of them--have created situations that are reversible only with costs and trauma that would exceed the benefits to be gained. This situation is not yet the case in Maine. It has been lightly touched by industrialization; the damage that has resulted from the failure to consider the social costs of limited industrialization in terms of environmental pollution is being corrected. The economic costs of correction, while high, are not prohibitive. Maine's greatest opportunity for the future stems from the fact that Maine has remained a renewable resource state, with its economy largely based upon wood products, agriculture, and fishing.

Although there has been a net inflow of population in recent years, reflecting the perception that Maine offers a refuge in a time of uncertainty and deterioration in the quality of life elsewhere, the numbers both relatively and absolutely remain small. Even so, the newcomers have already presented both burdens on, and benefits to, the resources of some Maine communities. If the trickle of new residents should become torrent in the years ahead, only by continuous monitoring and advanced planning can the State prevent environmental degradation.

More basically, Maine's future environment will be determined by the level of demand for land and both renewable and nonrenewable resources and by how conflicting demands are resolved. The level of the demand in turn will be determined

by the number of people exerting demands on the environment multiplied by the collective effect of their individual consumption patterns in respect to the State's environmental resources. Population times consumption patterns equals the demand on the environment; a demand which will tend to adjust to supply at either a financial cost or a cost in environmental quality. Each element in the equation -- population, consumption patterns and supply -- must be carefully considered to achieve optimum resolution of the inevitable conflicting demands.

Demands on Maine's environment may be exerted either internally by Maine's resident population or externally by non-residents. External demand may be further subdivided into the seasonal or transient demands of non-residents and the wholly external demands for Maine's present or future products, such as paper and energy.

Population growth rate is the annual rate of natural increase (birth rate minus the death rate in a given year) combined with a plus or minus factor of net immigration or net emigration. Birth rate and migration patterns can be affected by governmental policy. The natural increase of our population can be followed on a current basis and subsequent demands of this population can be projected comparatively readily. Migration patterns on the other hand, can shift abruptly and depending on the status of the migrants can exert sudden new demands on the environment and on society. Because of the potential ability of changing migration patterns to nullify planning assumptions, this factor in our population growth rate should be carefully monitored on a continuing basis.

The quality of life has an economic as well as an environmental dimension. A relatively low level of economic development, which characterizes Maine, carries

with its high social costs in terms of physical and mental health, unfulfilled human potential, and indifference towards the careless exploitation of natural resources. For Maine families living close to the economic survival line, environmental protection may understandably appear to be a luxury they can ill afford to support. But recent research indicates that most Maine people, while anxious for more jobs and income, also value the State's physical environment and the qualities of life that it permits. This fact has conditioned the approach of this report. We see the "environment" as both a subjective (psychological) and objective (material) phenomenon, central to the State's future economic well-being and to the happiness and welfare of its inhabitants.

In a recent survey<sup>1</sup> of Maine people's attitudes about the environment, it was discovered that nearly three-quarters of the people questioned felt that the quality of life in their communities had stayed the same or improved over the last five years. Compared to the figures available on American attitudes in general, significantly fewer Maine people felt that the quality of life had worsened. The higher percentage of people indicating this negative feeling came from the northern coastal region. Those married with children felt that conditions had improved. The proportion of long-term residents who felt that conditions had improved was larger than the proportion of short-term residents feeling similarly. Interestingly enough, the proportion of long-term residents who felt that conditions had worsened was also larger than the proportion of short-term residents with similar feelings. It was the blue-collar workers, those most affected by cost of living increases and economic difficulties, who felt that quality of life was deteriorating.

<sup>1</sup> - Social Science Research Institute, As Envisioned by the Maine People: A report to the Commission on Maine's Future. September 7, 1976

The question concerning why people like to live in Maine met with varying responses. On the coast residents generally agreed that the attractiveness of the environment was the main reason for living there. Municipal officials differed from the average citizen. Particularly in the southern and mid-coast regions these people, who tend to rely on the ocean as a source of income, were less likely to give environmental quality as a reason for living there. When asked whether it was disadvantageous to live on the coast, most residents said no; among those who did report disadvantages, the responses varied from region to region. "Isolation" was felt most in the northern coastal region, whereas "climate" was the complaint in the southern section.

When preferences for community life were tabulated, it was clear that Maine people prefer to live in rural rather than industrial or suburban communities. (This attitude has been documented by other surveys as well.) Coastal residents felt their choices of lifestyles could best be met in a rural farming or fishing community. The southern coastal citizens were divided. Some of the factors affecting community preference included family structure, occupation, and education. Married couples with children, unskilled or semi-skilled workers, and the high-school educated all indicated a strong preference for the rural setting; families without children, those unmarried with children, the well-educated, and the affluent tended to prefer suburban communities; and the grammar-school educated, the unskilled or semi-skilled workers, the unmarried with children favored the urban environment.

The question considering life twenty-five years from now met with an optimistic response. Fifty percent of those questioned felt life would be better, while twenty-two percent felt it would remain as it is today. In general, the persons with the most economic and social advantages were the most optimistic about the future, whereas those with fewer resources tended to be the most pessimistic.

The Maine environment is a key to, as well as a determinant of, the quality of Maine life. Recognition that Maine still offers unique options implies that in the past little was done to resist, much less to anticipate, the pressures effectively foreclosing some of the options. The Environmental Subgroup sees Maine at a critical point in history. Since the environment, however perceived or defined, is at the heart of Maine's uniqueness, it is the pivot on which a "feasible and desirable" future for the State must turn. This is perhaps the State's last opportunity to look ahead with major options still available.

#### B. Philosophy

The protection, management, and imaginative use of Maine's environment can and should result in a strengthened Maine economy, which recognizes the potential offered by the renewable resources, and permits a diversity of life styles. We believe it is possible to affect the size, level, and type of demand placed on Maine's environment.

The implications of this philosophy are significant:

1. Maine cannot be preserved as an exhibit of an America disappearing elsewhere. Change is inevitable, but its rate and type can be affected by government policy. To minimize the destructive consequences to the environment, all elements of the supply - demand equation must be addressed, (population, consumption patterns, and the environmental and financial costs).

2. Renewable natural resources of the type Maine possesses will become more important in state, national and international economies in the future. Maine must adopt policies insuring that the level of natural resource use does not threaten renew-ability. Use of nonrenewable resources must bring benefits--not merely economic--commensurate with their loss.

3. Adequate protection of the environment requires that those directly affected by such statutes participate in drafting the laws and in their administration.

4. Awareness of the unique qualities of the Maine environment should be the goal of education, formal and informal, at all levels.

Maine people have a capacity to react to challenges, once perceived, in constructive ways. The nature of the present and future challenge to Maine's environment as perceived by this subcommittee is spelled out in this report. Rather than making recommendations as such, however, the report describes the options available to Maine people in responding to these challenges. The choice of action or inaction is theirs.

#### C. Organization and Methodology of the Report

This report attempts to survey what has been accomplished in environmental protection over the past ten years, to pinpoint the future developments that may have a significant impact on our environment, and then to examine the past history, present status, and present or future problems that appear to be significant with respect to each of them. We have drawn extensively on the work of others who have more expertise than we possess; significant portions of our report of our report reflect their thinking, and in some cases their words, as well as our own.

In general, we proceed from the present and past to the future, and from the general to the specific.

## II. A Review of Principal Environmental Legislation

As a result of public pressures in the 1960's to protect the environment, the federal government enacted strong laws to preserve and to restore the quality of the nation's land, air, and water. Federal air and water laws established uniform standards to be addressed nationwide. In conjunction with this surge of federal legislation, the State of Maine outdistanced most other states not only in conforming to these laws but also in establishing many new ones of its own. Such legislation was deemed necessary partly because of serious threats to the physical environment and its aesthetic quality from summer visitors, residential and second-home purchasers, and commercial and industrial developments. Furthermore, Maine citizens began to recognize the need to protect natural assets available in the State--the forests, the open spaces, the unorganized lands, the clean water, and the coast.

As far back as 1941 efforts were undertaken to protect Maine's fresh water bodies, with the establishment of the Sanitary Water Board to control water pollution. This board was later replaced by the Water Improvement Commission (1954), then the Environmental Improvement Commission (1969), and finally the Department of Environmental Protection (1972). Each new commission assumed greater responsibilities associated with water pollution control. In 1953 the classification system of surface waters began. More concerted action began in the late sixties and early seventies under Title 38 of the Maine Statutes, Protection and Improvement of Waters. The Alteration of Rivers, Streams, and Brooks Act of 1974, 1975 and the Great Ponds Act of 1972 prohibit any activity that interferes with the natural water flow, or recreational, navigational, scenic and aesthetic uses, or that cause unreasonable soil erosion or harm to fish or wildlife habitats.

Much of the motivation behind water quality control came from the federal government. Efforts to clean up and protect the fresh waters were underway as early as 1956 with the passage of the Federal Water Pollution Control Act, which initiated the grant program for the construction of sewage treatment plants. Following the Water Quality Act of 1965, and the Clean Water Restoration Act of 1966, the Federal Water Pollution Control Act Amendments of 1972 provided the most comprehensive consideration of fresh water to date, calling for fishable, swimmable waters by 1983, zero discharge by 1985, river basin planning, and regional planning.

The Land Use Regulation Commission was established by the Maine Legislature in 1969 and was authorized to draw up a comprehensive land use plan for the half of the State that is unorganized. After several years of deliberating, the Commission has now drafted its plan to provide the basis for permanent zoning.

In 1969 the passage of the Wetlands Control Act led the way to more stringent regulations in 1971 and the Alteration of Coastal Wetlands Act in 1975 for coastal wetland protection. Any dredging, filling, or construction on or over a coastal wetland must be approved by the Board of Environmental Protection. Permits will be granted only if the proposed activity does not interfere with recreational or navigational uses or with natural water flow, does not harm wildlife habitat, cause soil erosion, or reduce the water quality of the area concerned.

In 1970 the State passed a Site Location and Development Act to regulate major industrial, commercial, and residential developments by requiring that certain land, water, and air quality standards be met for all developments in excess of twenty acres. It is perhaps the most important statewide land use law.

Recognizing the potential threat of an oil spill to the coastal environment, the Legislature passed the Coastal Conveyance of Petroleum Act in 1970 in an effort

to raise funds to cover emergency clean-up costs. These funds, accrued from a tax on barrels of oil brought in the State by tankers, can also be used for research and development.

The federal government established primary and secondary ambient air quality standards as a result of the Federal Air Quality Control Act of 1970. The State developed a State Implementation Plan which was passed as law in 1972. This plan required more stringent regulation of sulfur dioxide and particulate emissions and also established stricter ambient air quality standards. The purpose of these laws is "to preserve or enhance the quality of air...and to prevent air pollution."

One of the most successful attempts at land use controls is the Mandatory Shoreland Zoning and Subdivision Control Act of 1971. Stressing the need for local input, this law is aimed at protecting shorelands of both coastal and inland waters by requiring the zoning and subdivision control of a 250-foot strip of shoreland around major bodies of water.

In 1974 the Maine Legislature passed the State Register of Critical Areas Act which calls for the identification and registering of fragile areas having natural, historical, or scientific value. The conservation of these critical areas depends on the cooperation of private landowners as there is nothing in the bill which mandates protection.

Many of these laws have been amended since the initial legislation. There are other laws that also have environmental effects, such as the Farm and Open Space Law and the Tree Growth Tax Law. For the most part Maine people have come a long way in trying to protect their environment, and their efforts are beginning to pay off. The lakes are cleaner, the city areas are not threatened with high concen-

trations of air pollutants, and there should be significant improvement in the quality of Maine's rivers as a result of the waste-water treatment deadline of October 1, 1976. But the path has been difficult, and in many instances opposition to the laws has been great. Fear of many expenditures to clean up the environment, coupled with the fear that strong environmental laws will drive away potential industries and cause existing industries to close down in the State, has fostered this concern. However, the Department of Environmental Protection (DEP), the agency responsible for administering many of these laws, believes otherwise. Money spent by industry since the adoption of environmental legislation has been of substantial benefit to the Maine economy. For example, the paper industry has spent \$125 million for engineering and construction. Of the commercial and industrial projects requiring permits under the Site Location and Development Act from 1970 to 1975, only three commercial and two industrial projects were denied; 130 were approved. According to the DEP, there are only two known industrial closings that can be attributed to pollution abatement costs, and the evidence gathered on both of these has suggested that the management of the marginal or failing industry used environmental regulation as a scapegoat. While one cannot deny that some small, marginal industries are being forced to close down, the numbers are minimal; in the cases of severe hardship where owners are virtually unable to meet deadlines and standards, variances are permitted.

Except in the area of ground water pollution, to which relatively little attention has been directed, and non-point source pollution,\* the above-mentioned laws and other policies already enacted, such as the National Environmental Policy Act, are sufficient for the protection of the environment insofar as they consider the potential effects of any individual proposal. The laws are complex and problems most often arise in the administration of them. They do need to be continually re-examined for refining and updating.

\* Pollution resulting from any land-use activity which contributes to soil run-off. It cannot be traced to one specific source.

### III. Maine's Natural Resources: Problems and Options

#### Introduction

In looking to the future it is important to attempt to identify the probability of developments both inside and outside the State that may have significant impact on our natural resources. While the art of prediction is exactly that--an educated guess--there are developments, the probability of which is not so small as to warrant discarding

them in any effort to assess Maine's future. Some of these developments are antitheses of others, and which should be accorded more weight is a matter for individual judgment.

#### I. Population

The probability of increased population pressure on Maine's resources in the future is impossible to ignore. Maine is unique in the Northeast in its low population density. Although Maine's rate of natural increase in population has differed little from national averages, until about 1970 out-migration reduced the State's population growth to a very low rate and population was comparatively stable. However, since 1970 Maine has been viewed increasingly as a refuge from the problems of the expanding megalopolis to the south. This fact is reflected in the reversal of past out-migration to net in-migration in recent years. Furthermore, many of these new residents are in the prime working age group of the labor force. The pressure of this population increase is currently felt most heavily in the southern and more settled parts of the State, and may well intensify in the years ahead.

One possibility that might drastically increase the State's net in-migration is the national trend towards shorter work weeks. As the length of the work week approaches that of the traditional weekend, substantial numbers of people may decide

to reverse the usual first house and second house relationship, establish Maine residency, and commute to out-of-state jobs. If this occurs, the implication for new demands for services are staggering.

On the other hand, there are forces working against a continuing major outflow of population from eastern urban centers to other northeastern states. Relevant factors include escalating energy costs, gradual improvement in the quality of urban living, lack of employment opportunities in states like Maine, and rising prices for land even in rural areas. Even giving these developments full weight, however, it would seem desirable in looking ahead to assume that Maine's population will increase substantially through in-migration and natural increase. To monitor closely Maine's demographic trends and to prepare for this eventuality is comparatively inexpensive. If in-migration occurs and the State is unprepared, the penalty in terms of the environment and the economy could be severe. Therefore, we must give attention to ways of channeling in-migration to areas of the State where adverse environmental consequences are minimized. All State policy, especially the police power of the State (zoning and other regulation), and taxation should be carefully examined in terms of their effects upon migration - both in respect to geographic distribution and absolute numbers. Natural increase should also be carefully monitored and analyzed in terms of its environmental and social impact.

Since population is the principle factor placing demands on the natural resources and demographic patterns can be affected by all levels of government, these factors must receive more attention than they have in the past.

## 2. Energy

The disappearance of cheap energy is a certainty rather than a strong probability. Since Maine and New England are heavily dependent on imported crude oil, its scarcity and cost will have major implications for the future utilization of Maine's natural resources. Maine is well endowed with forest, which can be converted into energy through evolving technology. It also has sources of hydro-electric, tidal, solar and other invariant forms of energy, the potentials of which are currently being explored. Furthermore, the low density of population and the availability of unlimited supplies of cold water make Maine a possible site for nuclear energy plants.

We have alternatives available to meet a future energy shortage if we recognize the challenge now and respond to it constructively. But the character of this response also involves the question of whether we have freedom to plan for our own needs alone, or whether the external demands of the entire Northeast for more and different sources of energy have a major impact on our environment. For example, it is clear that any major development of large-scale hydro-electric power plants will require the expenditure of federal funds, which will involve the export of energy to other states as a major consideration. If there is emphasis on expansion of nuclear power plants, Maine is a logical candidate for such a "nuclear park," and much of the resulting energy would again be exported.

In the shorter run it is already clear that federal public policy calls for the development of potential sources of oil off the shores of Maine. The concurrent development of onshore support facilities to service sites is a definite possibility, as is the development of a refining complex to process this petroleum. Each carries with it certain threats to the integrity of the marine and coastal environment.

The most immediately rewarding response to inevitable energy cost increases, is to reduce, as far as is practicable, energy consumption. This reduction can be achieved both through conservation within current life styles and through altered life styles. Until very recently, energy cost and availability has scarcely been a consideration in most of our activities. In the future, the adequacy of our response to the decreasing supply of non-renewable energy sources will be measured by the degree of disruption of our economy, life styles, and environment. In short, the degree to which we recognize and anticipate this inevitable problem will determine the magnitude of its adverse effects.

Since Maine is but a miniscule part of the total energy economy, every effort should be made to decrease our dependence upon non-renewable, external energy sources. Emphasis should be placed upon energy conservation and utilization of renewable energy sources within the State as far as is economically practical.

The State should attempt to stimulate awareness of this problem in the public and private sectors and to monitor, evaluate and demonstrate developments in the evolving technology of both energy conservation techniques and alternate energy utilization applicable to this State. Federal energy programs will probably address the problems of more densely populated areas, areas lacking many of the options still open in Maine, and areas without the specific climatic problems of this State.

As in all problems where demand must adjust to supply of a finite resource, Maine's energy situation is one in which overreaction carries the cost of being overprepared. Under reaction carries the potential penalty of extreme disorder in the environment, in the economy, and in the lives of Maine people.

### 3. Water

Another developing shortage in urban areas to the south of Maine has a potential to affect the State. Pure water is in increasingly short supply in major centers of the Washington to Boston Corridor. Relative to these centers and to its own population's needs, Maine has an abundance of pure water. It is not beyond the realm of probability that before the year 2000 some efforts will be made to transport this water to other areas of the Northeast. There is adequate precedent in the West where water from the Colorado River is being piped to California to supply such cities as Los Angeles and San Diego with fresh water.

### 4. Metropolitan Wastes

To reverse the picture, Maine may be chosen as a location to dispose of the mounting waste generated in the major northeastern cities. While this possibility seems relatively remote, it cannot be dismissed completely.

### 5. Food Demand

There is certainly no question that the world demand for food will increase in the years and decades ahead. And, given the forecast shortages and costs of energy and therefore the costs of transportation, the future demand for agricultural production in Maine will rise. The problem is already being demonstrated by the rising cost of imported feed grain for the poultry industry. The widespread appearance of home gardens in recent years indicates that Maine residents already feel the need to reduce the cost of their food supply. This pressure will probably continue to increase, as will the demand for commercial agricultural products to be sold in urban centers of the Northeast and overseas.

For these reasons, it is highly probable that farm land that has been abandoned or under-utilized will find a new importance in the decades ahead. However, a

significant amount of it may be lost in the short run. Demand--not typically for agricultural uses--has already priced much Maine land beyond the reach of both native Mainers and the type of in-migrant of the past decade who, anticipating the developments described above, has sought to return to the land. The coastal area has already experienced the growing demand for Maine land which has sent land prices skyrocketing. This demand is working steadily inwards and from the southern part of the State towards the northern and eastern sections. Since frequently the best price can only be paid by out-of-staters, prime agricultural land has been transferred to developers in areas of growing population or bought for speculation where this phenomenon is as yet lightly felt. It is safe to predict that the demand for Maine land will continue to mount in the years ahead, with the strongest demand coming from outside the State. This demand will not be primarily geared to the potential productivity of that land but to its ultimate saleability, often in blocs of decreasing size and increasing price.

#### 6. Forest Land

Forest land occupies some ninety percent of the State's area. Some forty-eight percent of this forest land is in the hands of small woodlot owners. The remainder is owned and managed by large integrated paper companies or by land management companies. The largest portion of this forest is used for pulpwood to supply paper companies. To forecast the future of this natural resource involves, among other things, an estimate of future demand for paper first and then other products or uses for wood fibre, as well as consideration of the competition posed by other sections of the country that also have significant forest industries.

In the years ahead the demand for paper will increase but the mix of that paper may change; as less emphasis will be placed on high quality printing paper, lower

grade paper may become more practical. There is good reason to believe that Maine may become the center of production of softwood in the Northeast. Fir and spruce are already replacing wood from the West Coast as companies search for products closer to home.

The best current use (in environmental and economic terms) of the forest resource may not be the best use in the future. Wood products that are now disregarded may become economically important as a source of organic chemicals in refined form, or as fuel in their natural form. For this reason further integration in the forest products industry is a likely development for single-function companies, just as diversification will be a logical strategy for those already integrated.

The implications for the forest resource are similar to those for agricultural land, as urban pressures encourage conversion to other uses. We anticipate, however, that the operation of the market and other forces will shape the demand for forest products and result in better use of the resource. The disappearance of the small woodlot may have adverse environmental effects if the lot is transformed into residential, commercial, or industrial development. The need to protect forested areas of unique aesthetic quality, to provide adequate access for recreation by the public, and to insure that short-run environmental quality are matters for continuing concern. It must be borne in mind that while forests are renewable, forest land is not.

## 7. Altered Residential Patterns

The future cost and shortage of energy will, in all probability, alter residential patterns, which will favor protection of agricultural and forest land. The era of the internal combustion engine-powered vehicle used by individuals is already in jeopardy.

It will be in decline by the end of the century, barring major and unanticipated discoveries of oil deposits. As indicated earlier, this development has a high probability of gradually forcing population from suburbs and the countryside towards urban or semi-urban centers where employment and services are concentrated. This trend is already apparent in the surprising concentration of Maine's population along its main highway artery from Kittery to Presque Isle.

Although the resulting population concentration will probably not approach the density already typical of more developed states, it clearly poses problems of urban land use. The time to plan for increased density of population in such areas as the "corridor"\* is now rather than when its impact becomes more obvious.

#### 8. Future Federal Programs

It has already been suggested that federal legislation and policies towards energy conservation and alternative energy sources, not to mention environmental laws and taxation, will have a major impact on Maine's future environment. The relative emphases of federal programs and the availability of funds to implement these programs have guided and supported many of the State's efforts in the environmental area. Undoubtedly, this will continue to be the case in the future. However, the availability of federal funds and associated environmental emphases should not be allowed to divert attention from priorities within the State relating to our particular environmental problems.

#### 9. Changing Concepts of Private Property

A basic national trend that has become increasingly obvious in recent years has been acceptance of the concept that rights to private property are conditional

\*The term "corridor" refers to the fifteen-mile strip either side of the interstate which is

on society's needs. This view contravenes much of American experience and the traditional American viewpoint which still has a strong hold in Maine. Environmental statutes are designed to constrain private decisions with respect to private property where the results may adversely affect the environment. Taxation relative to natural resources sometimes has the same effect, whether intended or not. There is no present indication that these direct and indirect controls on private decisions affecting the uses of private property will grow weaker. If anything, the likelihood is that they will continue to increase. To insure that in the name of a good cause such as environmental protection, owners of Maine's natural resources are not unnecessarily deprived of their rights over their property, it is necessary to encourage their active participation in the public policy and legislative processes and to insure that administration of restrictive statutes is both equitable and relates as much as possible to the people affected. A definition of legitimate public interest is especially important for there is significant difference in what is the public's right and what is the good of the public; the latter should involve compensation to the private property owner.

#### 10. Air

Maine is fortunate to have an abundance of clean air. For the past six years, air quality has been monitored in five regions in the State, and the data available generally supports the belief that Maine's air is cleaner than the air of other, more industrialized states. One of the most serious threats that will affect air quality in the future is the transport of pollutants from outside the State. Since air is not confined by physical boundaries, Maine is subjected to the flow of air from areas to the south and west. Photochemical oxidants and hydrocarbons, never before posing problems in Maine, have recently been found over the Portland area. However, sources cannot be found in Maine, and there is good reason to believe that the heavier concentrations found along the entire eastern

seaboard to the south are being transported into Maine. Not only then is Maine in a poor position to control this problem, but any new industry wishing to locate in Maine might be penalized, even if it emitted only small amounts of these pollutants.

Very little has been done in the State to correlate air pollutants to respiratory diseases; yet Maine is third in the nation, under West Virginia and Kentucky, to receive disability payments because of respiratory diseases. Whereas such diseases can certainly be attributed to other sources, air should at least receive some attention. At the present time, there is no research capability in pulmonary medicine and very few specialists on the subject in Maine.

People do not usually think about air as an important natural resource, particularly in areas like Maine where there is an abundance of clean air. But already, in the major urban areas breathing has become hazardous to one's health; in the future Maine's land, water, and other amenities already discussed may not be the only attraction to outsiders. Clean air may attract newcomers to the State as well.

#### 11. Broad Areas of Concern

In summary, there is need for more information on the natural resources, and for the formulation of broad policies with respect to their future development. There is need for widespread public education about the importance of these resources, as well as need for anticipating developments that may diminish their availability and value. Finally, concern should be given to the administration of public policies in ways that minimize adverse impacts on private property while protecting society's legitimate interest in its uses.

There is an area of concern about which people and agencies of all types are becoming alarmed; the proliferation of environmentally - sound developments may create

a Maine that no one can envision. Maine people cannot rely upon the environmental laws alone to preserve their lifestyles. Environmental laws alone cannot halt the conversion of agricultural land, nor dictate shoreland uses. Environmental laws are no panacea against changes to landscape or lifestyles. The issues at stake here require political and social decisions beyond the realm that environmental laws treat.

### LAND USE

As the nation has become more aware of the fact that its natural resources are finite, there has been growing recognition that the supply of open land is very finite indeed. Therefore, the uses to which it is put are of increasing social concern. Throughout our history, since land in this country was abundant and cheap, its excessive exploitation in private hands was not a matter of great public interest. Concern about this situation has developed in the rest of the country more rapidly than it has in Maine, where the relationship between land and population still remains more typical of the nineteenth century than the end of the twentieth century. This situation gives our State one major advantage in looking to the future, we still have to make the best use of this irreplaceable resource in many parts of this State.

#### Historical Perspective

Like other states, Maine did relatively little to control land use until this century and, more particularly, the recent past. However, in 1821, the first year of statehood, Maine's Legislature authorized municipal officials to designate areas in each municipality for carrying on certain enumerated activities. More than a century later, in 1925, the Legislature empowered certain municipalities to regulate or to prohibit particular types of business in specific zones of the community. The constitutionality of this statute, which was tested in connection with the location of a proposed campground, was upheld in 1928.<sup>2</sup>

2 York Harbor Village Corp. v. Libby, 126 Me. 537, 140A, 382 (1928)

The public's legitimate interest in uses of private property is ultimately decided by the courts and is continuously redefined. For example, in 1908 the State's Supreme Judicial Court affirmed the public's legitimate interest in the uses of private property. In this instance the question was whether a landowner could be restrained from cutting undersized trees on his own uncultivated land without a monetary compensation. The Court's answer was affirmative, and its language unqualified: "...If owners of large tracts can waste them at will without State restriction, the State and its people may be helplessly impoverished and one great purpose of government defeated."

Acceptance of the State's interest in uses of private property as embodied in zoning gradually evolved in court decisions from the 1920's on. Initially, the courts placed the burden of proof on the municipality in contested situations. By 1973 it reached the point where the courts presumed the validity of zoning ordinances and placed the burden of proof of unconstitutionality on complainants.

Meanwhile, at the State level, a program of land use controls was embodied in the three major statutes previously discussed: the Site Selection Act of 1970, the Mandatory Shoreland Zoning and Subdivision Control Act of 1971 and 1973, and an extension of the jurisdiction of the Land Use Regulation Commission (LURC) passed in 1971.

The Saco River Corridor Commission is a unique attempt to control land use at the regional level. Solely a citizen endeavor, mandated by the Maine legislature, the Corridor Commission is responsible for the protection of the Saco River. It has established special use districts along the River's entire 150 - mile length and uses a permit process to insure that a proposed development meets the criteria set up for the district chosen.

Several private groups such as the Nature Conservancy and the Maine Coast Heritage Trust encourage the preservation and protection of significant natural areas

by a variety of means. Also on a voluntary cooperation basis among municipalities, eleven regional planning commissions serve as a forum for examination of regional problems, among which is land use.

In the span of a relatively few years, then, the State of Maine has become conscious of the need for planned land use and has created a variety of mechanisms to deal with these problems at state, regional, and municipal levels.

### Problems

Perhaps the fundamental problem of land use control in Maine is the lack of an overall policy, including minimum land use standards, relating to the future development of the State which would provide a framework for the refinement, coordination, and administration of existing statutes affecting land use. A scenario for the future development of the State based on conservation of natural resources and their use as the basis for jobs and income would have different implications for land use controls than would a scenario that sought increased industrialization for the economy. A future which necessitated increased concentration of population as a result of energy shortages would require different emphasis in land use control than would a future that permitted widespread dispersion of population. These are matters to which the whole Commission's report is addressed, but in particular they are obviously of vital importance to the entire problem of future land use. In any event, orderly change requires a far greater degree of certainty as to what individuals can or cannot do with land in the various parts of the State than presently exists.

The determination of what Maine should strive to become over the next several decades must involve widespread public involvement, citizen participation which transcends political party arguments. This is true for land use planning at all levels. In

the past, public involvement in the formulation of public policy has not been so widespread and vigorous as it must be in the future if there is to be understanding and support for land use decisions affecting Maine citizens. There is a great need for factual information that the public can understand. Annual town reports may be the medium for distribution of this information.

The control of land use to deal with the potential problems of growth and development has been addressed by planners at the local level, the county level, the regional level and the state level. Although these people are trying to deal with land use considerations, the efforts are fragmented, uncoordinated, overlapping and at times naive. People are not willing to grapple with the fundamental issues. Too often they get caught up in the details. The lack of public involvement is also responsible. Consultants are often hired to prepare land use plans and do so without consulting the individual whose lands are at stake. There are great problems in the implementation of these plans. Court procedures for dealing with violations of municipal ordinances have never been firmly established, the result being that each level of government believes that responsibility and jurisdiction for prosecuting violations lies with some other level of government. With no enforcement procedures, these plans many times serve only the individual's interests, for at the local level it becomes very difficult for one person to tell a neighbor what can and cannot be done. Many towns do not have the resources to deal with the complexities of land use control ordinances. Finally, the cumulative effects of land use decisions are not accounted for. For example, under the Coastal Wetlands and Site Location Acts, permits for developments must be granted if the environmental criteria are met. Increasingly, developers are meeting these criteria and permits are granted. Subdivisions are occurring rapidly, and building is being conducted at a rate that may have unanticipated social and political costs.

Defects of Present Land Use Legislation

1. Under the Site Location Law as presently administered, the Department of Environmental Protection makes decisions on the basis of individual applications. Decisions are based on the applicant's meeting all environmental criteria in a given instance, but the cumulative impact of a series of such decisions is not questioned.
2. If there are to be uniform Statewide approaches to land use problems, the question of overlapping jurisdictions between the DEP and LURC should be resolved. Some developments require a permit from the Board of Environmental Protection under the Site Location Act, as well as a permit from LURC.
3. Sound land use planning requires regional coordination. At present membership in regional planning bodies is not mandatory for municipalities. To close the resulting gap between the planning and the decision-making required to implement plans, all Maine municipalities may have to become members of regional entities.
4. The Mandatory Shoreland Zoning and Subdivision Control Act leaves much of the responsibility for implementation to communities. Not only does this permit wide variation in land use, the results of which may affect more than one community, but at present there is no comprehensive review of municipal actions under this statute.
5. Much the same weakness in enforcement characterizes the Alteration of Coastal Wetlands Act. It is also too limited in scope and should be expanded to apply to inland wetlands as well. The provisions for violations need to be strengthened as well.
6. The Critical Areas Act calls for the identification of critical areas, but additional legislation is required to protect and preserve these areas.
7. The Solid Waste Management Act has so many defects in practice, that this entire subject needs reconsideration with due attention to reconciling the problems of implementation at the community level with possible solutions at a regional level. There is

potential for new industries which will utilize what today are still considered wastes. Efforts so far to reuse and recycle limited resources have been frail at best. The technology for waste utilization will develop in part because we cannot afford the luxury of waste and in part because the costs of cleaning up that waste are becoming exorbitant.

### Options

1. The major problem of present environmental legislation arises in the implementation and enforcement procedures. Maine law is unclear as to who has this authority. Legislation should be enacted to specially empower some entity to enforce local ordinances. The district attorney's office is one place to prosecute violations. A town attorney also has this authority. One other possibility is authorizing a code enforcement officer, or other officer designated by the selectmen to prosecute a violation of a municipal authority. Since State law does not deal with the question of who may prosecute violations, the statutes should.
2. Establish a separate administrative law court to handle violations of municipal ordinances and/or environmental laws. This system is used in a number of states to facilitate prosecution which otherwise would not receive the attention of existing, and often over-burdened, courts.
3. Add to existing legislation as new problems of environmental protection become manifest. The difficulty with this approach is that many environmental problems are insidious. Without an increase in public awareness and a systematic monitoring of changes, it may well be too late to take corrective action.
4. Within the framework of existing legislation, leave it to municipalities to take corrective action with respect to environmental problems within their borders. While it has been repeatedly stressed that environmental protection should involve the

public directly in determination and administration of any constraints on private decision-making, it is clear that towns, in many cases, lack the incentive and resources to accept such responsibility. Furthermore, many environmental problems involve areas that extend beyond the boundaries of one town, or even several towns.

5. Encourage private individuals and organizations to promote land use decisions. Work of groups like the Natural Resources Council, the Audubon Society, the Nature Conservancy, the Maine Coast Heritage Trust, local conservation commissions, the Congress of Lakes Association, the Saco River Corridor Commission, and others has been important in increasing public awareness of environmental problems and in protecting limited areas of the environment. However, while such efforts deserve active encouragement, they depend on voluntary actions that are by definition inadequate to meet Statewide problems.

### Mechanisms

In view of developments that have a high degree of probability for affecting Maine in the future, a coordinated Statewide approach to the resulting

environmental problems seems highly desirable. This approach should be buttressed by more effective regional planning in close cooperation with municipalities in each region. Such an approach implies the desirability of considering the following:

1. Periodic public referendums on the major scenarios for the State's future development (e.g. emphasis on natural resources development, industrial development)
2. Re-implementation of the State Planning Office Enabling Act to bring together under common direction and control the widely scattered land use planning and control activities.
3. Financial incentives to promote municipal participation in regional planning bodies.
4. Statewide zoning for specified types of activity in line with referendum results (1.above).
5. Continuous monitoring of developments, such as in-migration, industrial development, and housing development, that have significant environmental impacts, with a view to determining the adequacy of existing legislation to cope with adverse effects and to increasing public awareness of demands on the environment.
6. A major effort to educate the public in the importance of land use controls and to encourage their participation in framing and administering them.
7. Encourage local initiative by establishing Statewide guidelines for environmental protection while giving municipalities adequate flexi-

bility to act for themselves. The penalty for failure to act will be implementation of the guidelines at the State level.

8. Recognize the need for an advocate for future potential industries to balance the voices of existing industry.

### FORESTS

Maine is the most heavily forested state in the nation with ninety percent of its land area in forest. There are seventy-six species of trees in Maine, only twenty of which are important commercially. Fourteen are softwoods - spruce, fir and other conifers, and sixty-two are hardwoods of which red maple is the most abundant. Though there are significantly more hardwood species than softwood, the volume of softwoods exceeds that of hardwoods by a multiple of three.

The most important type of forest in the State is the spruce - fir type. That is to say, the forests consisting predominantly of spruce trees and balsam fir are the most abundant, covering forty-seven percent of the forest land. Second in importance is the maple-beech-birch hardwood type, covering twenty-one percent of the forest land, and third is the white pine - red pine - hemlock type, a softwood forest covering a little more than ten percent of the land. There are seventeen million acres available for commercial production (can grow merchantable trees).

The forests play an important role in the natural functioning of the environment. The large root system and leaf cover help to prevent excessive water runoff, minimize soil erosion and ultimate sedimentation of nearby streams. Particularly important in Maine where there is relatively little top soil, the decaying parts of trees add humus and materials

to the underlying soil. Half of all photosynthesis occurs in the forest where an average acre of young trees may consume as much as six tons of carbon dioxide in a year and gives off four tons of oxygen. Furthermore, the cool environment of a forest provides a suitable habitat for many songbirds and wildlife.

The forest industry represents one of the largest industries in the State. Nearly one third of all jobs in Maine are provided for by the forest industry with 18,000 people employed in paper mills. Wages average some forty-seven percent higher than those of all other production workers in Maine. The combination of paper, lumber, and wood products generates one billion dollars gross manufactured value to the Maine economy.

Besides providing the wood industries with raw material, the forests play an important role in recreation. Hunting, hiking, camping, fishing and canoeing are being enjoyed by Maine residents and out-of-staters alike. For years recreation and forest practices have coexisted in large areas of the woodlands. Over the past two decades there has been a change in attitude among the general public over control of the forests. The public is pressuring for more forest land preservation for extensive recreational use. Conflicts between the general public and the private industries have arisen precisely because of this change. The forests are capable of supporting multiple uses, so long as land capabilities and knowledge of the forest resource and the interests of those dependent on the resource are considered in light of the social needs and desires of the public.

### Historical Perspective

The use of the timber resources in Maine began in the early 1600's when Europeans first set foot in the State and began cutting the white pines for ship masts. Shortly afterwards the first colonists who settled began to cut wood for ship building. The first

ship was built in 1607 at Sagadahoc and marked the beginning of the lumber industry in the State; with ships lumber could be easily transported to other parts of the nation as well as to Europe and beyond. The first major cutting of Maine's forests occurred in the late 1700's. White pine of the best quality was in high demand and it wasn't before too long that there was a dearth of this species. By the 1800's spruce assumed importance as the demand for lumber grew. Bangor soon became the most important lumber port in the world. Until 1839, Maine led the country in lumber production until the competition from lumbering in the West became intense. New uses for wood were experimented with and in 1868 in Topsham paper was first made. In the short time from 1868 to 1880, this industry developed from its crude beginning stages to become the largest wood industry in Maine. The shipbuilding industry was dealt a severe blow by the 1850's as steam and steel took over.

Who were these people that came to the Maine woods? The States of Massachusetts and Maine used to own these lands in early statehood, but needing money they sold to investors and land speculators. Because of the risk involved in owning timberlands in so remote an area, these new owners decided in advance of buying to spread the risk by joining with other speculators in purchasing. Under this unique system of ownership, the gains and losses would then be shared among several people and no one would have to bear the full brunt of failure. Over the years, the shares have been divided and sold so that today Maine has a complex ownership system. One deed written in 1963, showed one owner holding "31/52 part of a 1/8 interest in common and undivided" land in a certain ownership. This type of ownership system has necessitated a unified land management system. A manager hired by a conglomerate of owners is responsible for making management decisions on behalf of all the owners. Today 3.2 million acres of the commercial forestland are managed by land management organizations. One hundred thousand individuals

own approximately forty-eight percent of Maine's commercial forest land. Forty-nine percent is owned by forest industries; in no other state do forest industries own such a large share of the commercial forest land. Maine is the only State where public ownership is so low - only two percent. Only .5 percent is federally owned.

### Future Importance

Because of the increasing population and people's relative dependence on wood and wood products in the United States, the forest products will become increasingly important in years ahead. With the abundance of wood in Maine, this prediction could be encouraging for the Maine economy. Maine could become the center of wood production, particularly in softwood, in the Northeast. Over 250 products, ranging from pulpwood, spruce gum, ships knees, snow skis, bowling pins, and fir incense to housing and fuel are produced in Maine. Buyers outside the State are looking more and more to the East for spruce and fir as transportation costs are prohibiting long distance travel and as the quality of wood increases in the East. Consumption of wood in the United States has increased from ten billion cubic feet in 1950 to 13.5 billion cubic feet in 1973. The demand for wood will probably increase but the question remains whether the forests will be able to support those demands.

### Problems

It has not been economically feasible to manage intensively Maine's forests in the past. The abundance of trees was more than adequate to meet the demands for wood products. For 200 years only the best wood of a very few species of trees was harvested since the markets for wood products were limited. Hemlock and poplar, for example, have always been considered weed species; no use being found for them, they have been left in the forest. As a result several species were overcut in different parts of the State - yellow birch, white pine, northern, white cedar, ash, and oak, while others were left to rot on the stump.

The allocation of wood products to their highest value markets has often been tempered by the remoteness of much of the State's forest and by expenses which would be incurred in directing them to those markets. Improved access and market development would be desirable from this standpoint if practical ways could be found to accomplish these goals.

Another 1970 forest management problem is related to the pattern of ownership in Maine. Thirty percent of Maine's forest lands is in the hands of small landowners (owning less than 5000 acres), who do not have the resources or expertise to manage their lands on a sustained yield basis. While many are interested in increasing the production of their lands, there is not much money available to these owners, assistance from professional foresters is limited, and there is little financial incentive for the small woodlot owner to become involved in a management program, particularly in the southern part of the State where open land is under intense pressure for subdivisions and development for residential settlements. The dearth of service foresters at the State level and of federal extension agents aggravates the problem. There are only nineteen service foresters and one extension agent for 100,000 woodlot owners, 5,000 of which are actually tree farming.

The disease problem in the woods is another serious threat to the availability of wood fiber in the future. Spruce budworm, and to a lesser extent white pine weevil, dutch elm disease, and white pine blister rust are severely damaging valuable resources. All efforts should be geared to minimize the adverse effects of insect disease in the forests. If the forest is not protected, it cannot be managed, and without management it cannot be utilized on a sustained yield basis.

Inadequate knowledge of soil types in the unorganized territory has hindered intensive management of the forest resource. With proper soil data, it may be feasible to increase yield per acre significantly above that which is being produced at the present time.

It has been estimated that the forest land is capable of producing two to three times as much as it is today, market permitting.

Maine's forest products present considerable economic opportunities for additional value added within the State if processing beyond primary production can be made economically viable. At present, much secondary processing of Maine wood products is done outside of the State and outside of the State's economy.

While there is still an abundance of most species of trees in Maine, the forests deserve care to ensure their renewability and to maximize the benefits which can be derived from them. Increasing demands for forest products, increasing energy costs and greater scarcity of the raw materials for products that in the past have been substituted for wood products will stimulate or revive some markets for forest products. As demand increases, forest product prices will increase also; as prices increase, more sophisticated (intensive) forestry practices will become economically feasible. As a result both the volume and the value per unit of Maine's forest product will increase. Efforts should be made to hasten and encourage this trend.

#### Options

1. Take active steps to encourage research to control or eliminate the diseases affecting the forest resource, particularly the spruce budworm, the dutch elm disease, white pine weevil and blister rust. Emphasis should be placed upon biological control where this seems feasible.

2. In anticipation of increased demand, continued research should be conducted concerning returns of forestry practices that are not economically feasible at present. Attention should be paid not only to cutting practices, but also to fertilization and genetic improvement.

3. Complete the soils inventory in the forested areas of Maine so that foresters will be in a position to increase yield per acre and to determine the fertilization needs of various soil types.

4. Encourage the hiring of several more cooperative extension service foresters to assist small woodlot owners in the production and management of their forests. Furthermore, the State should create incentives to encourage small woodlot owners to retain their lands in the forest inventory.

5. Encourage by all practical means the addition of more value to wood products before they leave the State.

6. A fresh perspective, unconstrained by traditional markets and uses, should be used to consider all of the present or potential products of our forest land. Changing demand for forest products and changing availability of competitive products may produce viable economic opportunities for the State.

7. Develop incentives, including tax incentives, to keep forest land in production. Although not consciously written as a land use control device, the tree growth tax law serves that purpose since it forces owners of property over 5,000 acres to participate, yet penalizes them if they wish to withdraw their application.

8. Serious consideration should be given to the use of all legal techniques, from conservation easements to outright public purchase, as ways to reconcile conflicts resulting from the multiple use of the forests.

9. The U.S. Forest Service currently inventories the forests based on the merchantable bole. There is good reason to believe that it may at some time be economically feasible and ecologically sound to harvest the complete tree. Thus, further attention should be given to the idea of a complete tree inventory or extrapolation of current inventory information to produce complete tree data.

10. Consider the purchase of those forest lands containing fragile areas, areas with unique flora or fauna, or recreational or aesthetic potential for the people of Maine. Such acquisitions should be made in accordance with a rational acquisition plan based on agreed upon priorities.

11. Attention should be given to the ramifications of the possible use of wood as an energy source.

### AGRICULTURE

The agricultural products of current economic importance are poultry, potatoes, milk, apples, and blueberries. The combined value of these products currently represents about 95% of the total value of Maine's agricultural output. In 1923, Maine had the largest cash receipts from farm marketing in New England with a reported figure of \$407 million. Agriculture is critically important to the people of Maine both as a major industry and on a small scale as an avocation and a source of fresh produce and supplemental income. The agricultural economy defines the style of life for large numbers of Maine citizens in rural areas and is at the heart of social institutions, such as county fairs, the Grange, 4-H Clubs, and Future Farmers of America. The agricultural community is supported by the State through the Department of Agriculture in Augusta, the College of Agriculture in Orono, and the Extension Service, which has representative throughout the State.

#### Historical Perspective

In the past, Maine was far more dependent on agriculture than it is today. In 1880 farming in Maine was at its height. There were more farms, more land in farms, and more improved farm land than ever before or even since. Demand for dairy products was high, and hay, timothy, clover seed, wheat, and corn were all important. Wild low-bush

blueberries prospered in Washington County where barrens of well drained acidic soils abounded. Potatoes, Maine's principal cash crop since the early 1800's, grew well in the Caribou loam soils of Aroostook. Apples brought to Maine from Massachusetts and New Hampshire grew well in the Maine climate.

After 1880 agriculture in Maine seriously declined. Diseases hit most of the major crops, particularly as farmers turned to more intensive agriculture. Economics did not bolster production; as prices fell as they did for potatoes, livestock, corn, wheat, rye, and wool, farmers were forced to look for other sources of income. Lack of knowledge of farming techniques took its toll. Increased costs of operation and the burden of taxes as municipal services improved hit the farmer severely. Then, too, external pressures were beginning to be felt in Maine as competition from the West increased with the development of the railroad. The lure of the West and of the city reduced the number of people who were willing to farm; abandoned farms were an acute problem as early as 1890.

	1880	1900	1940
Number of farms	64,309	59,299	38,980
Acres of land in farms	6,552,578	6,299,946	4,223,297
Improved acres in farms	3,484,908	2,386,889	
Value of land and building	102,357,615	96,502,150	

But this is not to say there were no periods of prosperity after 1880. With more research and the discovery of better farming techniques, availability of commercial fertilizers, insecticides, the railroad, and modern, machine-run equipment, the remaining farmers increased their production of potatoes, particularly in Aroostook County where they were fast becoming a single money crop. By 1920, the County had earned the reputation of the Potatoe Empire of the East. Cooperative farming, which had been attempted during the nineteenth century but had never succeeded on the whole, began to work for numerous crops by the 1900's; in the potato industry organized farming later became the largest marketing cooperative in the U.S. Blueberry production flourished, particularly after the dis-

covery in 1929 that frozen blueberries were a popular item in the marketplace. Apple production reached its zenith in the early teens of the twentieth century. But many of the major problems mentioned earlier had not disappeared; if anything they intensified. Throughout the 1930's despite some revival, farming in Maine experienced overall decline. Though there was an increase in the commercial farming of sweet corn, dairying, apples, potatoes, and poultry, the new arrival on the scene, which began in Maine at the time of World War II, by 1940 farming was a thrifty enterprise with little resemblance to the farming of the '80's. Maine was not unique in this dilemma, however; the '40's were a period of adjustment all over New England as farmers strove to adjust to intense economic pressures. The trend was away from self-sufficiency to commercial farming, from small farming units to large, from extensive to intensive agricultural practices.

#### Future Importance

One of the fundamental determinants of Maine's future is the ability of its soils to produce food, not only for Maine's own population but for other parts of the nation and the world as well. In light of predicted food shortages, the protection and preservation of Maine's agricultural lands becomes imperative - not only for the benefit of those who will inhabit Maine in future generations but as an essential, if small, contribution to the survival of the human species.

A principal threat to the continued productivity of Maine's agricultural lands is erosion. Yet all of agriculture, except the poultry industry, is dependent on the soil base. Only one third of the cropland is adequately treated to keep erosion losses within limits to maintain long-term productivity. The evidence being gathered by the Soil Conservation Service suggests that the erosion and depletion of soils in Aroostook County is proceeding so rapidly that in twenty-five to fifty years it may no longer be possible to grow potatoes in much of Aroostook County. Erosion is also occurring in other parts of the State where feed for livestock is being grown more than ever before.

Another threat to Maine's agricultural lands is its permanent conversion to other uses. In parts of southern Maine the rapid population growth and changing housing patterns are creating strong pressures to convert agricultural lands to other uses. While no precise figures are available the Department of Agriculture suggests that more than 10,000 acres of Maine's prime agricultural lands have been permanently converted to other uses over the past ten years. Taxation policy may also be having an adverse effect on agricultural use of land, as well as other uses.

The lack of proper management of agricultural lands, erosion control, contour farming on slopes, and crop rotation can be largely attributed to external forces. Economic conditions have favored agriculture in the West which has deeper soils, more tillable land, and better markets than can be found anywhere in New England. Consequently, Maine farmers have had to struggle to survive. The success of potato farming in Maine has encouraged farmers to concentrate their activities principally on potatoes. The monoculture that has developed in Aroostook County had led to nutrient depletion, a consequent reduction in the ability of the land to produce, and an increase in the use of commercial fertilizers - all at a cost to the farmer.

Improper farming techniques have caused problems elsewhere in the State. The runoff of soils from the land has contributed to the water pollution problem, particularly in the St. John River Valley. The term non-point source pollution is used to describe a phenomenon of this sort where pollution cannot be traced to one source.

If one compares agricultural production to consumption, it appears that Maine is operating at a deficit in the production of almost all except the top five of nine commodities. Over 75% of the meat consumed in Maine is beef, veal, pork, and lamb, yet there is minimal local production. Maine imports nearly all of the grain and cereal products that

are consumed, Maine people consume 2.5 times the amount of fruits and vegetables that are produced, and there is virtually no production of food fats and oils.

While there is a clear moral obligation to protect the soil base on which Maine agriculture depends, there are also compelling economic reasons for protecting Maine's prime agricultural lands. If in the long run we are unable to manage Maine's renewable resources so as to provide a decent standard of life for Maine's people, the pressures for incompatible and destructive economic growth will be irresistible. It seems almost axiomatic that we should encourage and promote as much economic use of Maine's natural soil base as is consistent with long-range, sustainable activity. This, however, will require the development of public policy which is adapted to changing economic and social conditions; it will require a well organized and informed agricultural community and a general public which is aware of and sympathetic to Maine agriculture and its needs.

### Options

1. Prevent the continued erosion and depletion of Maine's agricultural soils and develop strategies for rebuilding soils in those areas which have already been eroded or depleted.

2. Inventory Maine's prime agricultural lands and protect them from conversion to other uses. While a strong agricultural economy will tend to ensure that Maine's productive agricultural land is not converted to other uses, competing pressure may permanently remove some of the State's most productive lands from agricultural production. Re-examine the priorities of the Department of Agriculture. The Department should be charged with developing specific legislation to prevent the permanent loss of agricultural lands and with researching and promoting efficient long-range farming techniques.

3. Develop a positive strategy for each of Maine's major commercial crops - i.e., potatoes, poultry, milk, blueberries, and apples. Improve quality, lower transportation costs, and improve marketing.

4. Encourage the diversification of Maine's agriculture to take advantage of local markets for beef, grain, vegetables, soy beans, and close-grown crops, such as hay, and promote their marketing as high grade products.

5. Develop strategies to improve financing opportunities for farm operations - such as low interest loans, Young Farmers Homestead Act, broadening of Maine Guarantee Authority programs.

6. In view of impending energy and transportation costs, recognize and encourage the use of small-scale agriculture as a means of providing supplemental income and fresh produce to Maine families.

7. Broaden research into using and recycling materials which are available locally as a substitute for petroleum-based fertilizer - i.e., rock phosphate, chicken manure, liquid seaweed, sludge, bark, etc.

8. Promote public awareness of the importance of agriculture to the State.

9. Encourage new and imaginative uses for food production, such as the year round indoor growing of vegetables, vegetable bores, and the use of the hot water discharged from nuclear plants for greenhouse heating.

### SALTWATER AND THE MAINE COAST

Maine is endowed with a saltwater coastline of over 3,500 miles. Its specific economic, recreational, and natural values have been appreciated for centuries. There is good reason to believe the Vikings may have been fishing commercially in the area about 1,000 A.D. or so. Indians fished extensively along the shores, as the presence of their

numerous large shell heaps now testify. Early settlers, John Smith, for instance, fully appreciated the protected harbors and fruitfulness the coast offered them. Maine's salt waters are still rich in a variety of marine resources - shrimp, shellfish, lobsters and fin fish. Coastal forests are the source of valuable wood products. The usual beauty and recreational potential have attracted many new residents and millions of visitors. The deepest harbors on the east coast of the United States are found in Maine, along with countless smaller sheltered anchorages. Sailors consider Maine waters to be among the best sailing waters in the world. Many of the early industries in Maine, ship building, lime, ice, and granite are located on the coast.

Until recently, the Maine coast was not adversely affected by the demands placed upon it; a relatively small population along the vast tidal shoreline created few problems. As was the case with so many natural resources there was a time when supply far out-distanced demand and there was plenty for all. Since World War II, however, the coast has become an area of rapid change. The coastal area, comprising 12% of the State's land area, is now home to 45% of Maine's population. Coastal Waldo, Hancock, Sagadahoc, and Lincoln Counties, with average population increases of about 13%, were the fastest growing counties from 1970 to 1975. Intensive residential and second home development of the coast have put major strains on water supplies and sewage disposal. Since the coastal fresh water is underlain by the salt water of the ocean, intense drilling for these water supplies, particularly on islands, has led to salt water intrusion into wells. Because proper septic systems are expensive to install in the shallow marine clay soils, much coastal sewage is inadequately treated when it reaches the ocean. Almost half of the productive clam flats in the State are closed to diggers for at least part of the year as a result of coastal pollution, causing an annual loss of \$5,000,000 to the Maine economy.

The Maine coastal waters have provided residents and non-residents alike with such recreational activities as sun-bathing, swimming, walking, camping, boating, scenic viewing, and sport fishing. However, only three percent is presently owned by the public. While those fortunate enough to own shorefront property may be satisfied, (and in many cases these owners are not Maine residents), the fact that only three percent of the coast is publicly owned has raised questions in many people's minds about the need for more public access. In the past shore landowners have sometimes extended implicit permission for use of their property for access to the shore. But as the pressures from visitors and abuses of the use privileges have increased, these owners have been reluctant to continue this permission. This pattern of pressure, abuse, and consequent withdrawal of permission to use private land is already apparent on the western coastal area with its increasing resident population and easy accessibility for visitors from the Boston area.

Perhaps the longest outstanding use of the coast has been commercial fishing. Not only is commercial fishing an important component of the Maine economy but it also defines a traditional way of life for many coastal residents. In 1974, Maine ranked second in New England with a commercial catch worth \$41,000,000 and ranked first in shellfish landings. Between 10,000 and 15,000 people were employed in the industry. Recently, aquaculture, the growing of marine organisms under controlled conditions, has been introduced for such species as salmon, mussels, oysters, northern lobsters, and shrimp.

Not to be forgotten as an important component of the coast are the coastal wetlands. These saline marshes are associated with the coastal streams having a limited watershed and are associated with two types -- those regularly flooded by tidal action and those of slightly higher elevation which are periodically flooded during neap and storm tides. Both areas support specialized types of aquatic vegetation adapted to various levels of salinity. These wetlands total only a very limited area of the entire coastline of Maine,

totalling only approximately 17,000 acres. Over half of these areas are west of the Kennebec, a large proportion in York and Cumberland Counties. There are about 59,500 acres of tidal flats.

West of Kennebec	
Salt meadow and regular flooded salt marsh	11,000 acres
Shallow and deep fresh tidal marsh	11,000 acres
Kennebec to Penobscot	
Salt meadow and regularly flooded salt marsh	2,000 acres
Deep fresh coastal marsh	6,000 acres
East Penobscot	
Salt meadow and regularly flooded salt marsh	4,200 acres

Of the 26,000 acres owned by the Federal Bureau of Sports Fisheries and Wildlife, only the Rachael Carson Refuge in York (1300 acres) contains wetlands.

The importance of these wetlands has all too often been mistakenly considered to be synonymous with economic value and little else. They are among the most productive lands in the world because of extremely high nutrient value. These tidal wetlands are the spawning grounds for fish, and the estuarine marshes are the nurseries where young migrate to feed. They are the area where exists the food web that supports all commercial fishing industry (including blood worms, sand worms, soft shelled clams, crabs, the saltwater sports fishing industry, and shellfish industry). They are also an extremely important food source and resting area for migratory birds, an important habitat for many of Maine's wild-life species - marine and song birds, raccoon, mink, muskrat, and even man.

These coastal marshes support a large amount of our consumptive uses (fish and manufactured produce) as well as non-consumptive uses -- such as bird watching, waterfowl hunting, nature studies and other forms of outdoor activities. They are literally a backdrop in the Maine outdoor scene that attracts people here and provides a part of our environmental for livability.

Another significant feature of these wetlands is the ability they possess to treat waters and recycle, a natural cleansing process - provided they are not overwhelmed by too much waste or chemical nutrients which can destroy a very sensitive environment.

As one looks toward the future, one view becomes clear. There is going to be considerable competition from all sides for use of the coast. The scenic magnetism of the coast will probably continue to create a high demand for real estate and recreational development resulting in soaring land values. These rising costs may have serious implications for towns or State agencies wishing to acquire the needed recreational land for public access. The value and demand for fish will increase. Trends internationally and nationally indicate that food will be in greater demand as populations increase. Whether fishermen in Maine will be able to meet this demand is an open ended question. There is excellent potential for aquaculture on the coast. There is also potential for an increased fishery in the Gulf of Maine, beyond the primary six species, for hake and polluck, as well as for some of the presently unutilized or under utilized species - mussels, sea urchins, squid, grayfish. The recent passage of the national "200-mile limit" legislation offers significant opportunities to the Maine fishermen. But at the present time the combination of small fleets, old boats needing considerable repair, inadequate port facilities and processing plants, unwillingness of financial institutions to loan capital to fishermen, and the lack of a crew willing to spend days at sea prohibit Maine fishermen from taking advantage of the expanded fishery. While the value of the catch has increased substantially over the last fifteen years, the amount of fish caught has decreased. The lobster, shrimp, clams, herring, marine worm, whiting and ocean perch catches have all experienced significant declines. The dearth of herring, ocean perch and whiting can be attributed to severe foreign

over-fishing. In the lobster industry over-capitalization and some over-fishing has resulted in the decline of this species, whereas the clam industry suffers from a multitude of problems.

The search for new sources of energy to meet national energy demands may also have implications for the Maine coast. Cold marine waters make the coast suitable for nuclear power plants. Deep harbors have attracted proposals for oil facilities. The leasing of drilling rights on the outer continental shelf to oil companies may result in considerable land based service facility expansion.

Efforts have been and are currently being made to protect this vast natural resource. People are concerned and are trying to deal with the issues. This enthusiasm has unfortunately resulted in some problems for it is felt now that there are too many agencies involved in coastal planning, research, and regulations - all often competing, duplicating efforts, and disregarding one another as well as federal agencies. This lack of coordination has at times resulted in poor public relations and confusion for all concerned. While there is much coastal activity at present, only Washington, Oregon, Connecticut, and California seem to be making headway in their attempts to manage their coastlines for the future interests of their citizens and of the nation as a whole.

### Options

1. Recognize the potential for the fishing industry as food prices rise and value of the catch increases. The ability of the ocean to sustain fishing can only be realized if competing uses of the coast are managed. Set aside suitable sites for which the primary purpose would be the production of protein. Take steps to alleviate the problem of overfishing either by foreign fleets or by Maine fishermen themselves. This could be achieved by means of international or unilateral negotiations for the former and by stricter licensing controls for the latter.

2. Establish an extension service to help fishermen prepare their cases for financial assistance to the bank, as well as to inform fishermen collectively of any fishing trends and improvements available to them.

3. Investigate the potential for developing fisheries of the unutilized or underutilized species in the Gulf of Maine. The present antiquated marketing system needs to be updated and made to serve more efficiently the fishermen, the consumers, the dealers, and the processors.

4. Evaluate the unique and fragile natural areas of the coast. Classify the coast according to suitability for controlled, private residential development, controlled or limited commercial or industrial development, and protection with little or no access permitted.

5. Consider all possible alternatives for providing better public access to the coast. These would include conservation easements, tax incentives, right-of-ways, property leasing, and acquisition of public access.

6. Evaluate carefully the economic, social, and environmental impact of potential, large industrial developments slated for the coast. While such developments may offer significant economic benefits to the State, the social and environmental costs may be excessive. Industrial developments should be sited in areas which will result in minimal conflict with the other uses for which the coast is valued. The effects both positive and negative of thermal pollution of potential energy development should not be ignored.

7. Consider critically the potential impact of man's activities on the long term welfare of wetlands adjacent to development sites. The cumulative effect of many such activities over a period of time will probably result in a gradual demise of this habitat

essential to welfare of many species. The laws are written to consider the singular effect and not the cumulative effect of more than one alteration.

8. Anticipate the social and environmental impacts of and prepare for the discovery of offshore oil discoveries on Georges Bank as there is reason to believe that Maine could become a site for oil processing and refineries.

### FRESH WATER

Maine is rich in inland surface waters with over 5,000 lakes and ponds, eight major river systems, and innumerable smaller rivers and streams covering seven percent of the surface of the State. In the northeastern United States east of the Great Lakes, the State of Maine ranks first among the states in its total area of inland surface water. Thirty-nine percent of the inland water area in New England, New York, New Jersey, and Pennsylvania combined is located in Maine. Only two percent of the population of about fifty million persons of these states lives in Maine, but populations of all these states look to Maine's inland waters as a significant regional resource.

Our society uses a great deal of water in various ways - for drinking, cooling, heating, washing, waste disposal, power generation, and manufacturing. There has been an increased demand for water resources for these purposes in the past twenty-five years, and one can anticipate that water demands will increase substantially in the next twenty-five years because of the expected increase in population density. Besides the municipal and industrial uses of water just mentioned, Maine people also use water in farming. While Maine does have abundant rainfall and therefore farmers do not rely heavily on irrigation, some irrigation is done in Aroostook County where vegetables and potatoes are raised. The fresh waters of Maine are very important for such recreational activities as boating, fishing,

swimming, and scenic enjoyment. Many people, appreciating the qualities which lakes and ponds offer, have built camps along their shores. An excessively developed shoreline poses an ever-increasing threat of pollution and destruction of the fresh water environment that has made our lakes and rivers so valuable and unique. As more and more people attempt to share the resources of our inland waters, the quality of those resources begins to deteriorate.

The federal government has done much to encourage statewide water quality planning. The Federal Water Pollution Control Act Amendments have various provisions for water quality planning, including the following:

Section 207 - this section calls for regional studies to be done on water quality in

large areas. Called "level B" plans, these studies have been completed for Long Island Sound, Southeastern New England, and the Connecticut River Basin. The New England River Basin Commission has been responsible for the level B plan for Maine.

Section 303(e) - this section requests states to plan at the river basin level. These studies conducted by the Department of Environmental Protection for Maine meet three objectives:

1. to provide water quality standards and goals for each region
2. to define critical water quality conditions
3. to provide waste load constraints

Maine has eight river basins and three sub-basin areas (which were identified as having severe water quality problems). These studies are descriptive in nature and offer recommendations for further study.

Section 208 - once the problems had been delineated through the means specified in the two previous sections, much more detailed areawide planning for waste treatment went into

effect. This section of the amendments calls for an analysis of water pollution problems, cost effective means for control, and a regulatory program and management system for implementing these controls.

Some of the 208 Plan Elements that have received priority in Maine are non-point source assessment, non-point source control needs, regulatory programs and management agencies. Non-point source pollution has only recently been recognized as a water quality problem. It can result from any land use activity which contributes to runoff.

Federal legislation has prompted states to undertake extensive environmental control programs, and in turn the State has encouraged towns to do the same (Shoreland Zoning, for example). But with State impetus municipalities have the power to undertake comprehensive plans. Under Home Rule, municipalities are granted any powers not denied by the State. Therefore, they may adopt major all-inclusive zoning ordinances if the ordinances are based on a comprehensive plan. Municipalities are directly charged with administering and enforcing shoreland zoning ordinances. With municipalities lies the possibility of broad water quality control. They can establish a forum to introduce and carry out effective lake programs through educational, legislative, and research efforts. Private citizens can become involved in water quality control by joining organizations like the Congress of Lakes Association, by encouraging town officials to adopt zoning ordinances, and by encouraging the development of conservation commissions, water districts, and river corridor commissions, such as the one previously mentioned. The Department of Environmental Protection is now accepting and encouraging individuals to become water quality monitors to take and test samples.

### Problems

1. The water quality control program of the State of Maine is well-established, especially with respect to point sources of pollution. Non-point source pollution control programs present one of the greatest current problems. It is reasonable to expect that population

growth and the consequent increase in housing will influence water supplies, and there will be increased problems of non-point source pollution in ground water and in those bodies of water where housing is concentrated along the shores.

2. There will be more and more pressure on the recreational facilities provided by lakes, ponds, and rivers. The cumulative effect of continuing development of fresh water shorelands does not appear to be adequately anticipated by present law. Further consideration should be given to the protection of fresh waters smaller than ten acres since the Great Ponds Act applies only to waters greater than ten acres.

3. With the exception of the Saco River, none of the rivers in Maine is managed as a unit. Each community with river frontage uses its piece of river as it sees fit with little or no regard to the use of the river as a whole. This fragmented treatment of the resource does not consider the river as the ecological entity which it is.

4. A two or three-year period of dry summers and below-normal rainfall could bring on a serious shortage of water in the northeast. A drought of the 1961-66 variety would probably be a catastrophe today. If dry-year cycles should occur with frequency in the future, there might be pressure on Maine with its abundant surface water supply for inter-basin water transfers to the metropolitan areas. While the political, legal and financial problems would be considerable, it is a possibility which the State should anticipate before the need arises and for which policies and decisions should be made.

5. The authority for managing Maine's water and related land resources is fragmented among at least ten agencies. Efficient and effective management calls for streamlining and coordination of this effort. A Land and Water Resources Council has recently been appointed for this purpose, but it is still too early to determine its effectiveness.

Generally speaking, regulatory tools to protect the State's wetlands are available and the future of these areas will depend upon future decisions concerning the administration

of these statutes. A strong land use framework and administrative policies must be developed if these areas are to be adequately protected in the future.

## ENERGY

One of the most serious issues confronting the future of the State of Maine is energy. As non-renewable sources dwindle in supply and costs for fuel increase beyond the means of Maine people, it become clear that attention must be drawn to energy conservation of existing energy sources and to new sources of energy.

The two major classifications of energy sources currently available are:

### Non-renewable or Finite Energy Sources

- Coal
- Petroleum, oil shale, and tar sands
- Natural gas
- Nuclear fission
- Nuclear fusion

### Renewable or Invariant Energy Sources:

- Falling Water (hydroelectric)
- Geothermal
- Solar
- Refuse
- Algae/bacteria agriculture
- Wood
- Wind
- The ocean tides, waves and currents
- Ocean pressure
- Temperature differential
- Electrostatic

It is generally concluded that the less dependent we become on finite, non-renewable energy sources and the more independent we become by utilizing invariant energy sources, which are renewable and/or non-depletable, the better we will be able to deal with our energy demands.

The question of energy is not so much one for Maine to solve as it is one for the entire nation. Much has been written on the need for energy independence in the United States.

While efforts are underway to find new sources of energy, there seems to be reluctance at the national level to develop a comprehensive energy plan. Without one it is difficult to draw up a State plan since Maine is dependent for three quarters of its energy consumption on oil, coal, or gas, all of which must be imported. However, despite the national response or lack of response, Maine must insure that it adopts both conservation measures and an alternate energy system as rapidly and as extensively as possible to reduce its dependence upon imported, finite energy sources.

At the present time Maine is a net exporter of electrical power. Over half of Maine's domestically generated power for domestic consumption is produced at Maine Yankee Atomic Power Plant. The rest is produced by industry, fossil steam, internal combustion sources, and hydroelectric plants.

Industry and transportation consume the greatest amount of energy in the State with residential and commercial uses next in consumption.

While wood use was once important in the State for heat generation, it became a luxury in the early sixties. However, the rising cost of fuel has again made wood a feasible source of energy for heat, particularly in rural Maine. As a renewable energy source, and the largest source of fuel in Maine, wood offers opportunities to Maine people as a supplement to existing energy sources.

Solar energy in Maine has received surprising attention over the past several years. Although it will probably not totally replace any single energy source, solar power for space and water heating in homes is becoming feasible. Experiments at the University of Maine and practical application of solar energy suggest that the future of solar heat at least on a limited scale is bright.

While Maine is a net exporter of energy at the present time, power is expected to be exported at decreasing rates until 1978 when new generating units should become operational.

Estimates indicate that through the next decade supplies will be adequate to meet internal demands for power provided fuel sources remain available. However, in the future Maine may indeed be faced with a dilemma. Pressure to provide neighboring states with power may increase putting demands on existing sources. Maine is committed to importing energy for transportation and so far has been unsuccessful in reducing gasoline usage.

### Options

1. Shift oil consumption from other demands to transportation and use Maine's renewable natural resources (wood, solid wastes, hydro-power, tides and the sun) to replace or supplement petroleum resources as rapidly as is practical.

2. Investigate the possibility of reopening abandoned hydroelectric plants, of which there may be as many as forty, of modernizing marginal operational plants, and of locating additional feasible sites for hydroelectric power generation.

3. Concentrate efforts on nuclear energy, as may be required to meet Maine needs. Special emphasis should be placed upon adequate consideration of the benefits and disbenefits presented by possible thermal pollution and of a satisfactory solution of the problem of disposal of radioactive-spent fuels.

4. Construct wood fired generation plants with provisions for using solid waste as fuel. With the development of such plants, the elimination of open dump burning and sanitary land fills could be expected.

5. Discourage the use of coal because it would have to be imported at significant cost, it presents substantial pollution problems, and it would not help the State achieve self-sufficiency.

6. Encourage citizens, industries, and commercial enterprises to spread their energy use patterns throughout the day to reduce peak power demands. Variable manufacturing production hours and differential rates may favor redistribution.

7. Adopt a strategy designed to promote rapid assimilation of both conservation and alternate energy techniques appropriate to Maine and to develop such techniques where adequate attention is not being paid to such opportunities appropriate to Maine.

8. Examine all avenues to stimulate and encourage conservation of energy both within our present life style and within alternate life styles. This is probably the most rewarding approach for the near term and success in this approach will have lasting benefit into the future.

As we consider the means for providing the energy requirements for the people of Maine, a balancing of economic social and environmental costs is required. We must stop discussing and begin developing and implementing ways to eliminate waste and to conserve existing capital energy sources. A transition from fossil fuels to renewable energy sources is critical, bearing in mind that all resources can be finite if misused. While we continue to consume energy from fossil fuels, we need to reduce non-essential consumption. We know all too well that burning fossil fuels, in addition to the waste inherent in their combustion, has considerable negative impact on the environment. Oil pollution on the coast, chemical emissions from automobiles, and thermal pollution of our waters should not be overlooked.

Finally, Maine should strive to become as self sustaining as possible. While Maine people should recognize the need for and try to generate energy for export, the State should build power-generating facilities for energy export only in concert with internal needs.

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