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# ENERGY, HEAVY INDUSTRY, and the MAINE COAST

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Report of the Governor's Task Force

September 1972

Maine. Governors Task Force on Energy, Heavy Industry and the Maine Coast.
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Resources for the Future, inc.

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The Honorable Kenneth M. Curtis
Governor of Maine
Office of the Governor
Augusta, Maine 04330

Dear Governor Curtis:

I have the honor to submit herewith the report of your Task Force on Energy, Heavy Industry and the Maine Coast.

In your charge to the Task Force given last December you asked us to consider several approaches to the development of heavy industries, especially the shipment and refining of oil, in the coastal region. We have done this in as careful and reasoned a manner as we could, and arrived at certain conclusions and recommendations which are set out in the last two chapters.

Throughout our deliberations we have tried to keep in mind the long and varied history of economic activity on the Maine Coast with the numerous ups and downs associated with ship building, forestry, fishing, and even ice production. Among the lessons to be learned from this history is that the essential quality and beauty of the coast should not be sacrificed to short-lived advantages of particular resource, technological, or locational features. Another lesson is that, within the strictures laid down by the first lesson, a decent livelihood for Maine Coast citizens must be provided. The reconciliation of these two factors--environmental protection and jobs--constituted the principal problem and challenge of our Task Force.

Our principal finding is that for the most part future heavy industries should locate in two designated zones on the Maine coast: one in the Portland-Casco Bay region and the other in the Machias Bay region. With certain exceptions noted in the report the rest of the coast--perhaps 98 percent of the coastline--would not be eligible for heavy industrial plants but would be retained

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for open space, scenic benefits, outdoor recreation and tourism, summer and year-round residences, appropriate light industry both old such as boat building and new such as aquaculture, and of course further planned development of cities and towns.

We see much merit in confining heavy industry, again with a certain few exceptions, to the two zones, both in the interests of more efficient operation of these industries and for the peace of mind of those who want the coast preserved for other values and uses.

On the urgent matter of oil development we recommend that the Portland-Casco Bay zone be eligible for oil refineries, port and trans-shipment facilities, and related industrial activities; but only after investigations of the July, 1972 Tamano oil-spill have been completed and all feasible corrective and preventive measures taken to protect against any future accidents of this kind. Regarding the Machias Bay zone we recommend that heavy industrial development exclude oil and oil related facilities at this time, awaiting further assurance that such activities will not constitute too great a risk of damage especially to the quality of the water in that presently unindustrialized bay.

The exceptions referred to earlier are principally two: the few locations where heavy industry already exists should be permitted to continue and to grow modestly to meet existing markets and provide jobs, and electric power plants should continue to be sited on a case-by-case examination having in mind not only the environmental effects at the plant sites but also the environmental effects of transmission lines.

In all cases new heavy industries, of course, will have to meet the standards established by the environmental improvement laws as administered through the Department of Environmental Protection and other relevant state, local, and federal laws.

To implement our primary recommendation for the two zones we propose a Maine Coast Industrial Development Corporation, set up under state law and having appropriate financial, managerial, land acquisition, and other powers. Adequate attention would have to be given to any possible adverse effects on the financial condition of near-by local political jurisdictions through provision of in-lieu property tax payments. Leasing charges on industrial sites within the zones should be such as to return at least some funds to the state government for general use throughout the state unless, of course, more general tax reform provides for a similar transfer from the new industries to the state.

As you charged me in our earlier talks I have tried diligently and persistently to find as large a measure of consensus among the diverse views of the members of the Task Force as I possibly could without watering down our findings and recommendations to the extent that they would be of no particular help to you and to the state. The members of the Task Force have entered into this consensus-finding effort in genuine good spirit. Individual members at times have expressed themselves vigorously but never acrimoniously. Most differences were slowly eroded through the process of discussion so that in our report we have found the kind of consensus that you were seeking on nearly all points.

The members of the Task Force would want me to point out that all of them agree with the zone approach taken in the report and with the general thrust of the conclusions and recommendations though not necessarily with each and every point. Significant modifications or disagreements of members are set forth where appropriate in the text, but our consensus turned out to be such that no member felt it necessary to make any separate, dissenting statement of his views in appendix form.

Our report points logically to certain next steps. A bill to establish the Maine Coast Industrial Development Corporation should be drafted for presentation to the next session of the state legislature. Further refinements in the geographic definition of the heavy industry zones and in the powers and procedures of the corporation will be necessary. The intention of the state to pursue the zone approach instead of the open-hunting approach by means of which industries and towns anywhere could vie for a heavy industrial plant should be made clear from the outset.

It was brought repeatedly to the attention of the Task Force that the deleterious environmental effects of continued unplanned, helter-skelter development of land uses along the coast would probably be more damaging than any likely heavy industrial development. Such effects in the past have resulted from the rapid growth of recreation and tourism along the coast; these effects will multiply in the future unless strenuous efforts, some of which have already been begun, are exerted to check and control them. We urge the state to strengthen its efforts along this line.

Finally, for the Task Force I want to thank the several departments and agencies of the State government, particularly the State Planning Office, which helped us so much in our work by preparing background and technical reports, presenting material to us in our meetings, and generally serving as our guides and consultants. We were fortunate in being able to secure important analytical reports from the Allagash Group and the Public Affairs Research Center as well as from a distinguished Canadian consultant. Peter Bradford, presently a member of the Maine Public Utilities Commission and formerly of your staff, was the Executive Director and Secretary to the Task Force; without his quietly effective work it is hard to see how we could have completed the assignment. The Task Force was ably assisted on particular projects by Ronald Poitras of the State Planning Office and P. Andrews Nixon, Vice-President of the Dead River Company.

If you would like additional information from us, I am sure the Task Force as a whole or individual members would be pleased to try to furnish it.

Sincerely yours,

Joseph L. Fisher

JLF/hmc

# REPORT OF THE GOVERNOR'S TASK FORCE

# ON ENERGY, HEAVY INDUSTRY, AND THE MAINE COAST

**Augusta, Maine**
**September 1972**

"To justify a course of policy in its largest dimension is to predict what will happen if that course is not taken, to prophesy the unknowable turns of history. All that any leader can do is call upon wisdom, judgment, and national principle, a sense of history and a knowledge of present reality, and act on the speculative and intuitive guess that results. This enormous limitation is reflected in Albert Einstein's famous reply when he was asked why the politicians could not catch up with the creations of science--he said that 'politics is much harder than physics'--and in George Kennan's testimony that 'the most important thing a government such as ours can have, as it faces the long term future,,., is right principles rather than the gift of prophecy.' The huge and inexcapable uncertainties of this process impose on any sensible statesman an essential skepticism, from which flow at least two guiding rules...: to decide as little, in places of danger, as present urgencies require, leaving room for change if events contradict judgment, and to take as few risks as action requires, refusing to hazard enormous consequences on speculation. The most frequent flaw..., running through the arguments on all sides, is the recurrent claim that the unknowable can be stated with certainty."

--- Richard N. Goodwin, **Triumph or Tradegy: Reflections on Vietnam**

## TASK FORCE MEMBERSHIP

| | |
|---|---|
| Joseph L. Fisher, Chairman | President, Resources for the Future, Inc,; Graduate and Member of Board of Overseers, Bowdoin College; former resident of Cherryfield, Maine |
| Elmer Beal | Executive Director, Maine Coast Heritage Trust |
| Nathaniel R. Bowditch | Executive Vice President, First Pennsylvania Bank & Trust Company |
| Alice Boynton* | Former President, United Low Income, Inc. |
| William Dickson* | President, William Dickson Associates, a municipal and regional planning firm |
| Wallace M. Haselton | Chairman of the Board, Depositors Trust Company |
| Horace A. Hildreth, Jr. | Chairman, Coastal Resources Action Committee |
| Curtis M. Hutchins | Chairman of the Board, Dead River Company; Member, Maine Board of Environmental Protection |
| David J. Kennedy | Speaker, Maine House of Representatives |
| Donaldson Koons | Member, Maine Board of Environmental Protection |
| Kenneth P. MacLeod | President, Maine Senate |
| John L. Martin* | Minority Leader, Maine House of Representatives |
| Donald Ruttenberg | Recording Secretary, Plumbers and Steamfitters Union |
| Sheila Seymour | League of Women Voters |
| Robert Shinners | Vice President, Northern Division, Great Northern Paper Company |
| William D. Shipman | Professor of Economics, Bowdoin College; former Chairman, Bowdoin Economics Department; Specialist in Energy and Transportation |
| Robert Smith | Lobsterman, West Jonesport |
| W. Jerome Strout | Chairman of the Board, Bangor & Aroostook Railroad; Member of the Board, Northern National Bank |
| Elwin W. Thurlow | President, Central Maine Power Company |
| Clinton B. Townsend | Former President, Natural Resources Council of Maine |

| | |
|---|---|
| Elmer H. Violette* | Minority Leader, Maine Senate |
| Charles L. Wyman | Member, Board of Environmental Protection |

* Other commitments precluded participation in preparation of final Report.

**NONVOTING ADVISORY MEMBERS**

| | |
|---|---|
| Philip M. Savage | Director, State Planning Office |
| Ronald Greene, Richard Choate, Spencer Appollonio | Commissioner*, Department of Sea and Shore Fisheries |
| James K. Keefe | Commissioner, Department of Commerce and Industry |
| David Stevens | Commissioner, Department of Transportation |

Messrs. Greene Choate and Appollonio each held the position of Commissioner in this Department during the Task Force's life span.

**Task Force Procedures**

The full Task Force met seven times, approximately monthly. The early meetings were devoted primarily to presentations by state agencies (Sea and Shore Fisheries, the State Planning Office, the Department of Environmental Protection and the Department of Commerce and Industry). These presentations considered the natural and human resources in question, present laws and recent cases, ongoing state coastal zone programs and possible future developments.

In February, the Task Force commissioned two papers, one (Appendix I) outlining a more industrialized future for the Maine coast, the other (Appendix II) analyzing the primary activities in a less industrialized future. The contents of these papers were the basis for discussion at the February and March meetings.

In April, the Task Force commissioned a review of the two "Futures" papers by a Canadian economist in order to obtain the perspective of a maritime region with some history of oil and heavy industrial development. That review is Appendix III. Also in April, the Task Force designated a drafting group (Doctors Fisher, Shipman, and Koons plus staff) to prepare a draft report. The drafts of the report were the basis for discussion at the April, May and June meetings.

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### Definitions

1. For purposes of this report, heavy industry is defined to be industry having one or more of the following characteristics: (a) High fixed capital requirements per employee, (b) substantial inputs of bulky raw or partially processed materials, fuel, electric power, or water, and (c) substantial environmental impact. Examples of heavy industry, so defined, include pulp and paper, petroleum refining, industrial chemicals, primary metals, large scale electric generation, and shipbuilding. Light industry, on the other hand, would be typified by most food processing establishments, electronics assembly (though not heavy electrical equipment), apparel manufacture, leather products, boat building, and furniture. In between will be numerous types of enterprise that do not fit easily into one or the other category. For example, a small-scale metal fabrication facility, an air freight terminal, a medium sized container port or oil terminal facility are difficult to classify under either heading. For present purposes, these latter types of facilities, unless they are quite large scale, are not construed to be heavy industry.

2. For purposes of this report, the State Planning Office's definition of the coastal zone has been adopted. In general, this coastal zone is a ten mile wide strip of land along the coast and tide-water areas including some 3100 square miles and more than 600,000 residents. We have deviated from the Planning Office definition in that we specifically include the area of water lying offshore for a distance of three miles and we do not extend the zone inland to the head of the tide on major rivers. The eastern boundary is the mouth of the St. Croix River on Passamaquoddy Bay.

## PREFACE

### The Governor's Charge

This report is the work of a 26 member Task Force created by Governor Kenneth M. Curtis on November 10, 1971. Governor Curtis instructed the Task Force as follows:

"In the five years during which I have been Governor of Maine, no single problem has been as complicated or as difficult to deal with as the question of heavy industry and the Maine Coast. From 1968 until today, the continuing flow of projects, facts, rumors, and inaccuracies has challenged every resource of state government in our effort to develop fair and strong regulations.

Our Site Approval Law is a step in the right direction, but members of the Environmental Improvement Commission, including its Chairman, have indicated that the Commission badly needs additional policy guidance if the State expects it to limit oil, power generation, or heavy industry to a small number of sites.

Because I have received so many letters and other expressions of concern from those who look to the future Maine Coast as a source of jobs in a time of high unemployment, recreation and solitude in a time or urban unrest, marine resources in a time of worrisome food projections, energy during an energy shortage, tax dollars to relieve unfair property taxes, and profit in a declining economy. I am convinced that each of these uses must accept some limitations if the others are to be accommodated. No one activity may claim the entire coast or be conducted in such a way as to substantially curtail other uses. Any activity which would ruin the coast for Maine people should be prohibited.

The studies, hearings, and controversies of the last two years have added much to our knowledge. To draw conclusions from this knowledge, I am appointing this Task Force. The State's need is not now for an exhausive study but for well considered and impartial advice. I therefore charge you as follows:

I am asking this group to prepare policy recommendations to guide future state action in the area of industrial development on the Maine Coast. Specifically, I am asking you for guidance in minimizing the conflicts which many feel will arise out of the interplay between recently proposed energy oriented activities such as oil refining or power generation and the more traditional uses of the Maine Coast such as fishing, tourism, vacation homes, recreation, and residence. To the extent the guidelines which you develop are applicable to other types of heavy industry, I hope that you will so indicate.

Much of the immediate urgency of your task arises from the several past and pending proposals for oil development in Maine's deepwater areas. I am therefore specifically asking you to consider a) the feasibility and consequences of limiting the number of areas to be considered as potential oil ports, b) the feasibility and consequences of foregoing oil development at present, and c) the feasibility and consequences of continuing with the strict case by case approach which the Site Approval Law now applies to our entire coast. I am also asking you to assess the possibility of clustering future coastal energy production and perhaps other heavy industry in one or a few sites while preserving the rest of the coast for other uses.

I am hopeful that this task will be completed at the earliest opportunity but not later than June 1, 1972.

In conclusion, I want to emphasize that the work of this group will not be used to weaken the Site Approval Law or any other environmental protection measure. I hope that your report will provide a framework for future State legislative and administrative action which will promote the highest and best use of our coastal resources and which will spare the State and the EIC the costs and confusions of continual heavy industrial speculation over the whole length of the Maine Coast."

## PERSPECTIVE

This Task Force was assembled to make recommendations to the Governor on the specific issues of energy and heavy industry on the Maine coast. Our mission was to consider information and experience now available and to try to reach a consensus on conclusions and recommendations. We have not functioned as a research group in search of new information, and we feel that it is important to acknowledge at the outset that a report such as this would be substantially strengthened by completion of the various coastal resource inventorying projects now underway. The requirements of federal and state environmental laws will in any case necessitate a thorough completion and evaluatio of much of this work before essential permits can be granted to any heavy industrial project.

There are certain further limitations which the reader should keep in mind with regard to the report.

First, the report is concerned only with coast. Such restraints on random industrial growth as it may impose apply only to the defined coastal strip. A close relationship will inevitably exist between the future of the coast and the economy and ecology of Maine as a whole, but limitations on heavy industry in the coastal zone do not, for better or for worse, limit such sites in the non-coastal 90% of the State.

Secondly, while all of the information available to the Task Force suggests that the assumptions which we have made with regard to particular heavy industries are realistic, we have no assurance that these industries are in fact knocking at the door. Only expansion of the electric power industry can be predicted for the coast with some confidence, and it is at least possible that the much discussed oil refinery will not come. The recommendations in the report are, to some extent, based on assumptions, not predictions. Combinations of events entirely different from those postulated in Chapter 2 are possible. However, while the events may be different, the types of decisions called for will probably be unchanged. That is why right principles are needed more urgently than plausible prophecies.

Third, we have not attempted to deal with the issues involved in offshore exploration for oil and gas. An extensive report on this subject is being prepared for the New England Governors by the New England River Basins Commission in conjunction with the Massachusetts Institute of Technology. That report should be available by the end of the year and will be more extensive and well-grounded than any remarks on that subject by this Task Force.

Fourth, we have deliberately made no effort to assess public feeling either in Maine as a whole or in specific localities. Our report is advisory to Governor Curtis, and there will be ample opportunity for public hearings at both state and local levels before any of our recommendations can become law. We do not intend the exclusion of political calculations from this report to suggest that final decisions should be made without full public participation; we do feel that this report will be more useful for not having been tailored to meet subsequent public reaction.

Fifth, there has been some debate in the legal community in Maine as to the constitutionality of previous proposals similar to some of our recommendations. This debate can be expected to rekindle around any legislation that may result from this Report. At this point, it is enough to say that, while some care in drafting will be necessary, we are confident that our basic recommendations can be implemented constitutionally within the framework of present concepts of land use law, property law, and environmental law.

Nevertheless, the Maine Constitution restricts the exercise of eminent domain to governmental projects with a clear and broad public purpose. To the extent that eminent domain is essential to implement our recommendations, an early test case would be desirable.

## Chapter I

## BACKGROUND

### History

Five themes relevant to this report emerge from the general history of the coast.* These themes are the critical role of transportation in Maine development, the relative absence of the economic benefits of higher wage value adding manufacturing industry, the inseparability of Maine from the Nation, the eagerness of the state to aid development and developers, and Maine's failure to recognize until very recently that development imposes some social costs which government must minimize and apportion fairly.

With regard to transportation, Maine's coastal economy has flourished when it fit national needs in waterborne commerce or when transportation economics dictated that Maine's imports and exports should move by water. The coastal economy reached its zenith when Maine raw materials were processed prior to export. Shipping out raw lumber could sustain the coastal economy but using that lumber to build Maine ships brought greater prosperity. Limitations in transportation, location, and natural resources have prevented other forms of coastal activity from doing more than sustaining particular localities. Only fishing has been of continued importance over most of the coast, but even here, as with coastal traffic in tourists, granite, ice or oil, the absence of significant value adding manufacturing activity has limited the benefit to the state to the value of the basic resource, if found in Maine plus transportation and service charges. Only in the case of long term summer residents do transportation and service charges amount to much per item handled, and the wages paid rarely approach national or regional averages.

Thus a major significance of recent oil and power plant proposals is that they would depend on, although they would not process, newly valuable Maine coastal resources (deep water, cold water, available land) to offset Maine's historic geographic disadvantage. Furthermore, they would be more significant to the state economy than any past manufacturing industries except shipbuilding, paper production, and the very early saw milling. Among potential non-heavy industry developments, aquaculture might offer similar benefits from value adding processing as might the location of modular housing or conventional fish processing operations in Maine.

The historic inseparability of the Maine economy from national trends and policies is proven by the destructive effects of the 1807 Embargo and the Civil War, as well as by the consequences of federal subsidies to the U.S. Merchant Marine, the denial of protection to fishermen, the trend away from wooden ships, and the aborted Passamaquoddy tidal power project. Present day counterparts would be the oil import program, supertankers, the recreation boom, and the extension of Boston based manufacturing growth into southern Maine.

The eagerness of the state to aid development and developers is a clear theme in the history of the railroads, the power companies, and the paper companies. Rights of way, water rights, and huge tracts of land were conveyed out of the public domain during the last 100 years on liberal terms.

* The State Planning Office prepared a brief coastal history for the Task Force. Copies of that paper may be obtained from the Planning Office; it is the basis for the historical outline at Appendix IV.

Slightly less direct recent subsidies took such forms as low taxes, tolerance of all types of pollution, and loan guarantees. The Site Approval Law and the extensive scrutiny now given to development oriented laws and activities are proof that Maine now intends to drive harder bargains in the public interest than it did in the past.

Lastly, a historical review of this nature is a reminder of the forces, trends, and time scale within which the state government is operating. No evaluation of present development possibilities can be realistically made without some sense of the past history of the coast. It is an area which has seen 200 years of economic activity ebb and flow. Some of the constraints, some of the encouragements, some of the scars and some of the benefits have endured throughout that time. Except for fishing and some kinds of shipbuilding, farming and logging, no specialized business activity has spanned the two centuries.

**Recent Past**

As the Governor's charge notes, the Maine coast offers different and sometimes inconsistent hopes to different people. A chronology of recent pressures which have necessitated a review of the role of heavy industry on the coast would include the following:

**1968**

Maine Yankee continues construction of Wiscasset nuclear power plant.

Occidental Petroleum Company and the State of Maine announce plans for a 300,000 barrel per day oil refinery at Machiasport to relieve high New England oil costs and to provide a supertanker port on the U.S. East Coast.

TEPCO announces plans for a nuclear powered aluminum smelter at Trenton, is rejected by Trenton voters, considers Biddeford and Kennebunkport before going to Berlin, New Hampshire where it is still seeking approval.

Shaheen Natural Resources Company announces its desire to build a refinery in the Machiasport foreign trade zone.

**1969**

Atlantic Richfield announces interest in constructing a Machiasport refinery some distance from the coast.

Atlantic World Port (no kin to Atlantic Richfield) announces interest in constructing a Machiasport refinery.

Federal government announces that no decisions on Machiasport will be made until the oil import program has been reviewed.

The icebreaking tanker Manhattan reaches the Alaskan North Slope on a route which stirs speculation that Alaskan oil will be refined in Maine.

An unnamed oil company purchases options in Perry.

King Resources Company (KRC) buys former naval oil storage facility in Portland Harbor, announces plans for a supertanker storage and transshipment facility.

**1970**

Federal oil import review ends inconclusively, no action taken on Machiasport projects.

Maine Site Approval and Oil Handling laws passed with broad statewide support.

Oil Handling Law enjoined pending determination of lawsuit filed by oil industry.

King Resources project rejected by Environmental Improvement Commission (now the Department of Environmental Protection). EIC partially reversed in court, but KRC, in financial difficulty elsewhere, goes bankrupt leaving status of terminal in doubt.

Engineering firm of Ford, Bacon, and Davis seeks Machias area options on behalf of unnamed petrochemical company.

First supertanker (250,000 deadweight tons) arrives at St. John, New Brunswick, 42 miles from Eastport.

Fuel Desulphurization, Inc. announces South Portland refinery proposal. Province of New Brunswick announces plans for extensive supertanker development at St. John.

City of South Portland rejects Fuel Desulphurization, Inc.

**1971**

Maine Clean Fuels (an offshoot of Fuel Desulphurization) announces plan for Penobscot Bay refinery.

Environmental Improvement Commission rejects Maine Clean Fuels proposed Penobscot Bay refinery.

Legislative Research Committee announces study of feasibility of Eastport refinery.

Metropolitan Oil Company announces plans for Eastport refinery. Legislative Research Committee terminates Eastport study. Environmentalists and proponents of particular sites or projects combine to defeat legislation designed to create Maine Industrial Port Authority empowered to establish one oil port at an undetermined location.

Commerce and Interior Department officials, still not having acted on 1968 Machiasport applications, accuse Maine conservationists of obstructing efforts to build East Coast supertanker port to combat high oil costs and energy shortages.

THT Associates attempts to get permission to build terminal on Passamaquoddy Indian reservation near Eastport and refinery on the other reservation, near Princeton.

Passamaquoddy Indians reject THT.

Atlantic World Port conveys Machias options to the Allagash Group and dissolves.

**1972**

Corps of Engineers, Commerce Department, and Council on Environmental Quality announce projects to evaluate port sites, including six in Maine. Commerce Department still has not acted on 1968 Machiasport applications.

Interior Department announces desire to explore for oil and gas on the Continental Shelf off East Coast states.

Tanker "Tamano" strikes ledge, loses more than 90,000 gallons of industrial fuel oil into Casco Bay causing extensive damage to shoreline, clam flats, and boats.

Maine Oil Handling Law still enjoined as a result of oil industry suit.

Maine Yankee generates conservationist objections to site at tidal node on coastal bay with low flushing rate, forced to curtail power output and change discharge plans.

**Recent Developments in Coastal Planning.***

**Maine** – Until recently Maine did little to regulate use of its coastal areas and submerged lands. Comprehensive planning to define and protect the public interest was nonexistent.

The philosophy of private and local government management was to emphasize fisheries development and forest harvesting. This approach was consistent with a moderately growing state population and economy based largely on agriculture, fishing and forestry. Only since the state became attractive for significant coastal industrial development and tourism has a reappraisal taken place.

Late in 1968 the 103rd Maine State Legislature established a State Planning Office and directed it to prepare comprehensive plans for the physical development of the state. To carry out this assignment, the Planning Office has undertaken:

(1) A Comprehensive Policies Plan consisting of a coordinated statement of goals and objectives for all functions of state government.

(2) A Comprehensive Coastal Development Plan started in October, 1969. Unexpected federal and state funding shortages have slowed this program, but a comprehensive inventory of all coastal natural resources in Penobscot Bay has been completed and will be a model for other coastal areas.

* This section is based on a more extensive State Planning Office background paper, copies of which may be obtained from the Planning Office.

A major incentive to coastal planning and management was the strong, continued interest of major oil companies in locating oil handling and processing facilities on the coast. In 1970, reacting to potential oil industry expansion into Maine, the state passed two of the strongest environmental laws in the United States. One of these, the Oil Handling Law, provides a Maine coastal protection fund to finance the cleanup of oil spills. The operation of this fund has been enjoined for two years pending settlement of a lawsuit filed by major oil companies. The other, the Site Approval Law imposes statewide review for large scale development projects. As of August of 1971, 124 projects were reviewed. One hundred eleven of the projects were permitted or found to be exempt, four were denied, and nine were withdrawn.

Zoning has in the past been the most sophisticated manifestation of the extent of local planning and local land use control. With the recent passage of the State Shoreline Protection Act, all communities in Maine will be required by July of 1973 to zone at least those areas within 250 feet of all coastal, river and lake shorelines.

Of the 139 civil subdivisions along the coast 31 now have zoning ordinances, 59 have completed local comprehensive plans, and 115 communities have been included as part of regional land use planning programs now underway.

**Other States** — Three or four states have land use controls similar to Maine's site approval law. One state, Hawaii, has advanced to the point at which coastal land use decisions are made on the basis of a sophisticated system of area classifications based on existing resources and compatible activities. Most other states regulate particular activities and types of pollution and have a planning process, but only a few have moved comprehensively toward state level land use controls. Delaware has prohibited further heavy industrial development beyond the major petrochemical plant now located in its coastal zone.

**Federal Legislation** — Apart from single purpose federal actions such as the aforementioned deepwater port survey, the push for offshore oil exploration, and pending power plant siting legislation, Congress is considering a variety of bills aimed at fostering national land use planning and coastal zone planning. Coastal zone management bills have now passed both branches of Congress and gone to a Conference Committee.

The federal role seems likely to consist of extensive funding of state planning coupled with the establishment of guidelines and standards against which state planning and enforcement will be reviewed. The primary responsibility for planning and enforcement seems likely to be lodged in state government with some opportunity for delegation to interstate, regional, or local units of government.

**Projections**

There is a dearth of basic projections throughout Maine state government which weakens policymaking. As background for this report it will be helpful to set forth at this point some of the sketchy and sometimes inconsistent predictions that have been furnished to us, while reiterating that these predictions are not ours. In addition, certain other projections are discussed where appropriate to particular topics, and Appendixes I and II contain projections of their own.

1. Population — depending on assumptions regarding migration, fertility, and mortality, Maine's population in the year 2000 will be between 1.0 million and 1.3 million. The lower figure would involve little or no change over the next three decades. The higher end of the range would involve a population increase of about ten percent per decade. Population will probably grow primarily in the southern coastal counties and little if at all in the northern and easternmost areas.

2. Employment is projected to increase from slightly more than 400,000 today to about 550,000 by the year 2000. In 1980 it will have reached about 440,000.

3. Under current conditions, Maine is experiencing a shortfall of about 7,000 jobs per year in terms of new entrants to the labor force. This gap has been projected by some state agencies to continue or widen slightly with a resulting combination of high unemployment and outmigration.

4. Without corrective governmental and private action most Maine fisheries will experience a decline in the fish caught per man hour worked. However, with proper incentives and conservation, Maine fisheries can be reasonably expected to reverse recent downward trends.

5. Tourism and tourist related revenues will double between 1970 and 1980 and will continue to grow but less dramatically, in the two following decades.

6. Maine and New England energy demands are projected approximately to double every 10 years for the rest of the century.

## Chapter 2

## ALTERNATIVE FUTURES AND POLICIES

In evaluating the alternatives open to Maine with regard to heavy industry the Task Force considered several different hypothetical future courses. In one of these futures, no further coastal heavy industrial development was permitted. In another, heavy industry on the coast was limited to one or two zones; in the third, the state continued to consider coastal heavy industry on a case by case basis under the Site Approval Law with certain changes in the criteria for approval. Completely unrestrained location of heavy industry on the coast has already been rejected by the passage of the Site Approval Law and was not regarded by the Task Force as meriting consideration.

## NO FURTHER COASTAL HEAVY INDUSTRY

The prohibition of further coastal heavy industry, which would require changes in the state's laws and perhaps even its Constitution, would reserve the coast entirely for the types of development portrayed in the report prepared for the Task Force by The Allagash Group (TAG) (Appendix II). These development types are:

Tourism and recreation.
Second home development.
Fishing and aquaculture.
Research and educational institutions.
Retail and consumer service firms.
Light industry and agriculture.

Coupled with a sprinkling of heavy industry, these six activities are the basis of the current coastal economy. Expansion restricted to these activities would produce the smallest change in the character of the coastal zone as a whole. However, this is not to say that the coastal zone would be unchanged. It is reasonable to expect that the denser development of the Casco Bay area would expand northward and that profound changes in the density and character of the coast east of the Kennebec would result. Scarcity of sand beaches and greater distance from Boston suggest that the phenomenon of the one day summer visitor will not extend beyond Portland, and, for the same reasons coupled with soil suitability, the very dense summer cottage developments on the York County beaches are unlikely to be repeated to the east.

### Tourism, Recreation, and Second Home Development

Despite the foregoing limitations, recreation oriented economic growth in Maine in the next 20 years will be dramatic. The TAG report projects a 1980 doubling of tourist days spent on the coast from 12.3 million in 1970 to 24 million, and a trebling to 35.6 million by 1990. Tourist expenditures are expected to increase even more, going from $104.3 million in 1970 to $311.5 million to 1980 and $575.2 million in 1990. Other estimates, which take into account a recent trend toward inland development along with limitations in soil suitability on the coast, are somewhat lower, and TAG asks that its figures not be regarded as firm. In any case, the trend is clear.

In addition, a total of 23,000 new summer homes are forecast by 1990. At an average expenditure of $18,000 per home, these will result in a total investment of $414 million, or $20.7 million per year. Approximately 2/3 of this expenditure, or $13.8 million per year, could stay in Maine with significant income and employment multiplier results.

Second home development will have a significant additional impact. First, the TAG report forecasts an additional 16,000 renovations at $8,000 per renovation during the 20 year period. This would result in an investment of $128 million, or $6.4 million per year. In addition, coastal property tax revenues, at current assessments, would increase by $1.4 million per year. and between four and five thousand new jobs might be created.

Two further benefits from second home development are: (1) second home owners are clearly the most economically desirable of all tourists because they spend the most, and (2) the caretaking and maintenance jobs generated by empty second homes in the offseason. However, these benefits must be weighed against the fact that tourism and recreation on the Maine coast are heavily seasonal activities, and growth in the summer peak will do little to produce a satisfactorily balanced coastal economy.

Tourism, recreation, and second home development, although often environmentally juxtaposed against oil and other heavy industry, do bring significant environmental problems of their own. Clam flats closed in the vicinity of most Maine towns and summer resorts were closed by locally originated pollution, not by oil spills, and several York County towns are choked to the point of serious congestion by human traffic not by industrial air pollution.

In short, a coast from which heavy industry is barred will not automatically be pollution free. The environment of the non-industrial future will depend heavily on vastly improved sewage treatment and on sophisticated resource inventories, land and transportation planning, and land use controls. Specific recommendations in this area are beyond the scope of this Task Force, but we do urge attention to the recommendations in the TAG report (pp. 89-92) as well as in the recently completed Penobscot Bay Pilot Project of the State Planning Office. A further step in the right direction is the Natural Areas Inventory project which the Planning Office has now completed for the entire coast. Priorities must be assigned to those areas which the Legislature agrees are in need of special protection even as the state continues to apply its Shoreland Zoning Act and its Site Approval Law.

**Retail and Consumer Service Firms**

The TAG Report (pp. 85-87 and the recently published **Maine Manifest** indicate that, without state action, much of the profit and related economic benefit of increased tourist and recreation development will go out of state to national food and lodging operations. While such operations are not evil in themselves, they do skim off dollars which might otherwise be reinvested in Maine. Whether the state approaches this problem through traditional laissez-faire, through state development, through local development corporations, or through reinvestment requirements and incentives, the problem is real and complex. It merits more careful analysis than any underway.

**Fishing and Aquaculture**

The future of conventional fishing and aquaculture have been the subject of much debate in Maine. Even on a nonindustrial coast, both face significant problems

Aquaculture in Maine is confronted by uncertain economics and legal barriers to ocean floor leasing. Removal of the legal barriers is hampered by the resistance of fishermen to a perceived threat of competition from the products of aquaculture. The TAG Report suggests that this apprehension is not well founded with regard to the most probable aquaculture ventures because the demand for the fish (lobster, salmon, or oysters) is great enough to absorb major increases in supply without disastrous price effects.

Without additional pilot projects, the true potential of aquaculture and its impact on Maine's conventional fishery will remain basically unascertainable. Whether or not the logal obstacles are removed and pilot projects undertaken in the near future, significant aquaculture impact on the Maine coastal economy in the next five years in unlikely. Beyond 1977, the potential impact, although it may be significant, cannot now be determined. It should be noted, however, that the Department of Sea and Shore Fisheries feels that the potential of both aquaculture and the conventional fisheries is far greater than the yield now being realized and that the fishery resources, properly managed, offer economic benefits at least on a par with heavy industry.

The principal problems confronting the conventional fishing industry are subsidized foreign competition, and inefficient processing and marketing structure, outdated equipment, overfishing, and sewage pollution. These problems will persist and call for remedies by Federal, State, and private action regardless of whether environmentally regulated heavy industry comes to the Maine coast. If remedial steps are not taken, the decline of the conventional fishing industry will continue at about the same pace in a non-industrial future as in a controlled more industrial future.

**Research and Education**

Material covered by the Task Force does not permit concrete judgments as to the economic role of research and education facilities in a nonindustrial coastal future. Certain observations, some of which stem from those contained in the TAG Report (pp. 83-84) are possible:

(1) Such facilities will be at least partially marine related. Coastal land will probably be too expensive for those which can as easily be located inland.

(2) The direct economic impact will be more in the stemming of outmigration of skilled personnel then in the alleviation of basic unemployment.

(3) The indirect economic impact of such facilities may be considerable. They will certainly be of use to existing industry and very likely will also germinate concepts on which new ventures could be based.

(4) The tax base impact of these institutions will vary but, in general, it is probably no better than slightly positive.

(5) For this Task Force, the most important conclusion is that the future of such facilities does not depend on whether the future of the coast contains heavy industry. Indeed, for certain types of research facilities, nearby client industry would be a prerequisite.

**Light Industry**

As the TAG Report notes, factors such as transportation and labor force are likely to result in light industry east of Bath and probably east of Portland being located away from the coast as long as the transportation system adheres to the present general pattern.

Those light industries such as boat building and fish processing which will continue to locate on the coast can be expected to grow in proportion to the water related activity on which they are based. Again, the presence or absence of heavy industry per se is not a governing factor although polluting heavy industry would clearly have a major adverse impact on the growth of many types of coastal light industry.

* * * * *

This significant point recurs in each of the above sections: limited heavy industry designed, located, and regulated to meet stringent environmental standards does not appear to have a substantial impact on nonindustrial development.

## LIMITED HEAVY INDUSTRY

The second hypothetical option considered by the Task Force consisted of limiting heavy industry to one or two zones. The rationale for permitting any heavy industry in the coastal zone would be that: (1) some types of heavy industry which require location on or near the ocean would not otherwise locate in Maine: (2) many of Maine's present manufacturing and product export activities are shrinking or barely holding their own, and these sectors must expand to assure balanced growth and opportunity in the state; (3) such activity does provide well paying jobs, tax revenues, and valuable products; (4) with proper locational and environmental surveillance and sound general planning, ecological and social costs can be kept to an acceptable level; and (5) the activities discussed in the nonindustrial future are not incompatible with properly controlled heavy industry.

The rationale for limiting such industry to one or two zones would be that: (1) environmental controls are more easily imposed and supervised at central locations; (2) Maine's immediate or medium range attractiveness to heavy industry is not so great that the state need fear that it will be concentrating numerous well regulated polluters in ways likely to lead to harmful cumulative total discharges; and (3) the state gains valuable certainty from knowing more or less precisely where its future heavy industry will be. The value of such certainty lies in the predictability which it affords to people, industries, coastal towns, and the state. Individuals know where heavy industry and accompanying jobs will be, and conversely, where they may buy and build secure in the knowledge that it will not be. Towns may plan their futures without distraction from the will-'o-the-wisp which heavy industry is for most of them: those towns without heavy industry will, as Chapters 3 and 4 indicate, still share in the tax benefits.

Very few large industrial concerns would not trade the remote possibility of a debatable bonanza for real predictability on which to base their future development planning, but this principle is not yet accepted widely by state and local governments. It is, nevertheless, an essential premise to the argument in favor of industrial zones that heavy industry and its proponents would trade a fighting chance to go anywhere in Maine for an assurance that they may go somewhere, while those concerned about the adverse effects of heavy industry would trade their fighting chance to block all such projects for an assurance that most of the coast, including its most ecologically and scenically important areas, will not be recurringly menaced by the spectre that they perceive heavy industry to be.

**One Zone**

This approach postulates the location of all future heavy industrial development in one coastal zone. Such a zone need not and probably would not be one solid, fenced-in piece of land, although such an area might comprise the bulk of a zone. The primary limitation on the zone would be that it would be restricted to one harbor area with shared port facilities preferably owned by the state.

For reasons set forth in the Public Affairs Research Center (PARC) paper prepared for the Task Force (Appendix I), the first such zone would almost inevitably be in the Portland area. It is important to stress that this does not mean that the zone itself would be in Portland. In fact, although the zone would certainly reach the water at Portland or South Portland, much of the industry should be located in some section of the considerable open space still available within a 30 mile radius of the Portland waterfront.

Portland's deep water, access to Maine's largest and most diverse labor market, proximity to southern New England and New York markets, transportation connections, and more nearly compatible present land and water uses all make it the most logical site in coastal Maine for a heavy industry zone. Its major disadvantage is a relative shortage of available land, but, as noted earlier, this is really a problem only on the waterfront.

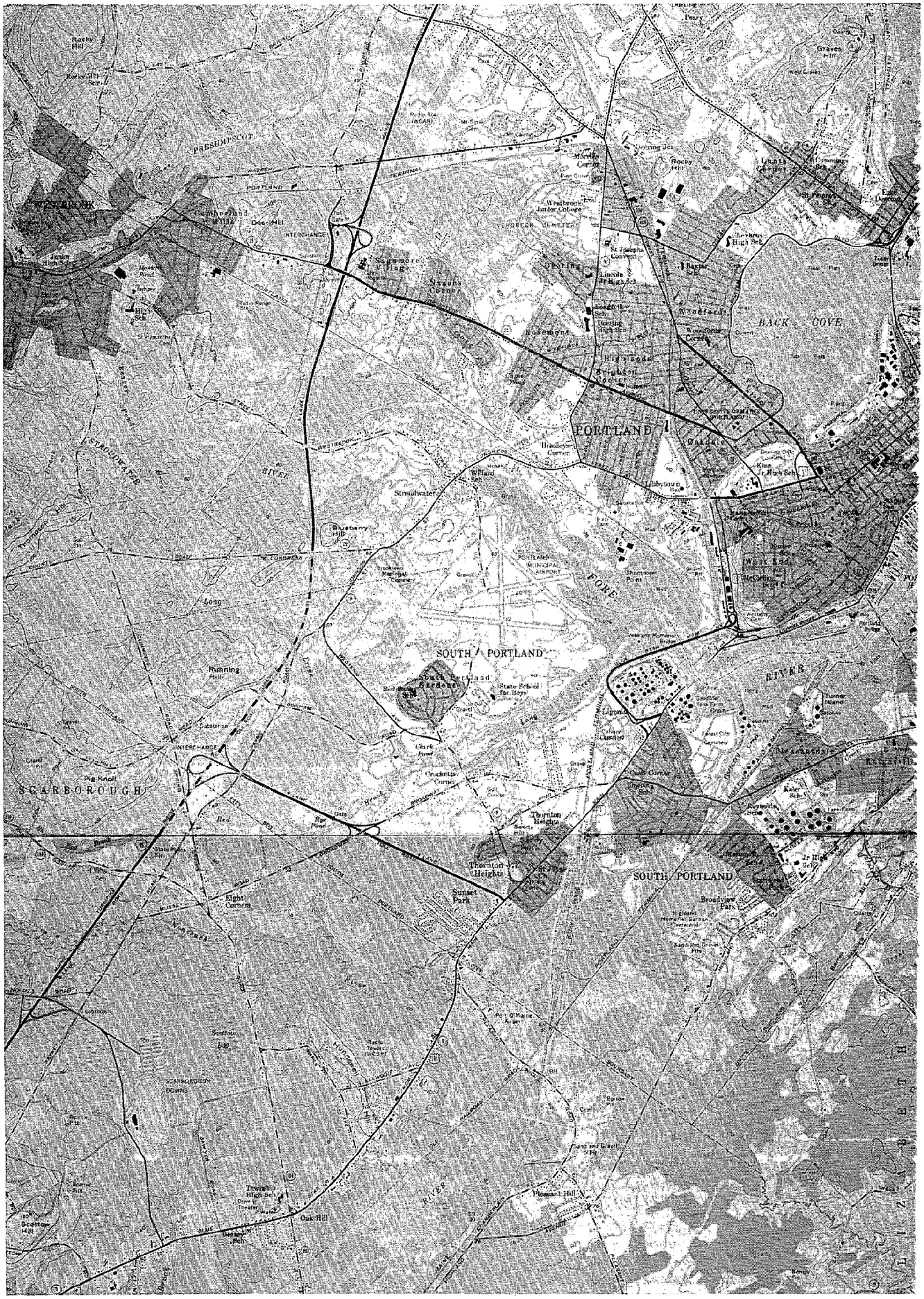
For purposes of this report, it is more important to analyze properly what might happen in such a zone than to predict exactly what will happen. To that end, we have postulated but not predicted that the zone would include either a 100,000 barrel per day or a 300,000 b/d oil refinery, a large power plant (which might have to be on or near the ocean for cooling purposes) and a paper mill. Other industries might be integrated with these to good advantage.

Other economic benefits would include additional tax revenues, additional energy or other product benefits to present Maine industry, and possible new industry through the availability of an assured energy supply. The importance of the latter benefit is reinforced particularly by the allusion to the New Brunswick Power Development Corporation's surplus capacity policy contained in the third special study for the Task Force (Peter McLoughlin, "A Canadian Perspective" Appendix (III, p. 103).

Less direct economic benefits would include the check which jobs in these facilities would have on outmigration of executives and skilled workers and the attraction of at least some skilled out-of-state managers, workers, and other personnel to Maine.

A possible but speculative benefit would be impact on oil prices. Maine's industrial oil prices are already part of the world market system and probably would not vary significantly. Home heating and gasoline prices are supported at artificial levels by the national program of oil import restrictions. A refinery which received a significant quota could favorably affect these prices, particularly if in its early years it were owned by a refiner seeking to establish or increase his market share. It is significant, however, that proximity to a refinery in the United States today does does not necessarily mean lower prices.

The costs of such a zone would include some degradation of water quality, some air pollution, possible thermal discharge, the removal of a sizable tract of land from other uses, some scenic impact, and substantial expenditures for schools, highways, and other state provided services.



PRESUMPSCOT
WESTBROOK
Cumberland Mills
Deer Hill
INTERCHANGE
Sagamore Village
Nasons Corner
Westbrook Junior College
Deering
Rosemont
Highlands
Brighton Corner
Woodfords
Woodfords Corner
BACK COVE
PORTLAND
Bradleys Corner
Libbytown
Oakdale
Stroudwater
Blueberry Hill
STROUDWATER
RIVER
FORE
PORTLAND MUNICIPAL AIRPORT
Thompson Point
SOUTH PORTLAND
South Portland Gardens
State School for Boys
Ligonia
Clark Pond
Crocketts Corner
Thornton Heights
Sunset Park
Eight Corners
Running Hill
Pig Knoll
SCARBOROUGH
Broadview Park
Pleasant Hill
Oak Hill
Township High Sch
Scottow Hill
Graves Hill
Rocky Hill
Lunts Corner
Chevarus High Sch
Baxter Sch
Lincoln Jr High Sch
Deering High Sch
Longfellow Sch
St Josephs Convent
Rocky Hill
Rocky Hill Sch
Junior High Sch
High Sch
Long
Red
Brook

**THE GENERAL PORTLAND AREA**—Heavy industry with port or terminal facilities on Casco Bay could be located away from the waterfront, not necessarily in the map area. West Cod ledge, off the map to the southeast, must be recognized as an additional but not insurmountable obstacle to large tanker traffic.

The direct economic impact of these plants would appear to be as follows, (Appendix I, p. 61).

IMPACT OF SELECTED HEAVY INDUSTRIES ON MAINE COAST

| | Unit | Petroleum Refinery (100,000 bbl.) | Petroleum Refinery (300,000 bbl.) | Elec. Power Plant (800MW nuclear) | Elec. Power Plant 800MW fossil | Pulp & Paper Mill |
|---|---|---|---|---|---|---|
| Construction cost | ($ mil) | 175-240 | 325-475 | 200 | 140 | 120-130 |
| Construction employment* | (persons) | 700 | 1,400 | 640 | 300 | 1,000 |
| In state | | 510 | 700 | 576 | 270 | 750 |
| Out-of-state | | 260 | 700 | 64 | 30 | 250 |
| Construction payrolls** | ($ mil) | 9 | 11 | 23 | 9 | 8 |
| In state | | 6 | 6 | 20 | 8 | 6 |
| Out-of-state | | 3 | 5 | 3 | 1 | 2 |
| Operating workforce | (persons) | 124 | 175 | 80 | 60 | 600 |
| In state | | 83 | 88 | 80 | 60 | 500 |
| Out-of-state | | 41 | 87 | -- | -- | 100 |
| Operating payrolls | ($ mil) | 1.6 | 2.2 | 0.7 | 0.5 | 5.0 |
| In state | | 1.1 | 1.1 | 0.7 | 0.5 | 4.0 |
| Out-of-state | | 0.5 | 1.1 | -- | -- | 1.0 |
| Direct & indirect employment | | | | | | |
| Urban multiplier-1.8 | (persons) | 223 | 315 | -- | -- | -- |
| Rural multiplier-1.3 | (persons) | 161 | 228 | 104 | 88 | 780 |
| Water intake | (mgd.) | 0.9 | 1.7 | 613 | 360 | 30 |
| Water discharge | (mgd.) | 0.9 | 1.7 | | | 28 |

* Annual averages; ** Totals

Sources: Stone & Webster Engineering Corp. (petroleum refineries); Central Maine Power Co. (electric power plants); Great Northern Paper Co. (pulp & paper mill); partly estimated by PARC.

There is no denying that oil spillage will occur in the vicinity of oil operations and that such oil spillage is harmful to marine life. Therefore, some diminution of the natural resources of the state would occur. Experience in Portland Harbor prior to the recent oil spill did not indicate that routine small spills result in quantifiable losses of jobs or income, but losses to the total fishery resources of the state must be least partially reflected in lower incomes in sectors of the fishing industry.

Experience in Portland and elsewhere suggests that with the exception of the relatively remote possibility of a major oil spill, from which the affected area would not recover completely for 2 to 5 years (or longer if the oil adhered to uncleanable rocks or became incorporated into the tissues of the local shellfish), present technology is capable of keeping pollution costs and effects within tolerable limits. The entire analysis in this report assumes that the state would require the most advanced available environmental controls and monitor the results.

One environmental advantage peculiar to the Portland zone is the possibility that a refinery located there could transport its products to southern New England, or at least to Portsmouth, by pipeline rather than barge or coastal tanker. If this distribution system proved feasible, the possibility of major or minor oil spillage from the refinery would be greatly reduced.

Lastly, as stated earlier, the outside consultants to the Task Force (TAG, PARC, and Peter McLoughlin) are unanimous in indicating that such a zone need not adversely affect the nonindustrial activities discussed earlier in this chapter. Furthermore, McLoughlin indicates (Appendix III, p. 104) that such zones are already the rule in the Canadian Maritime Provinces.

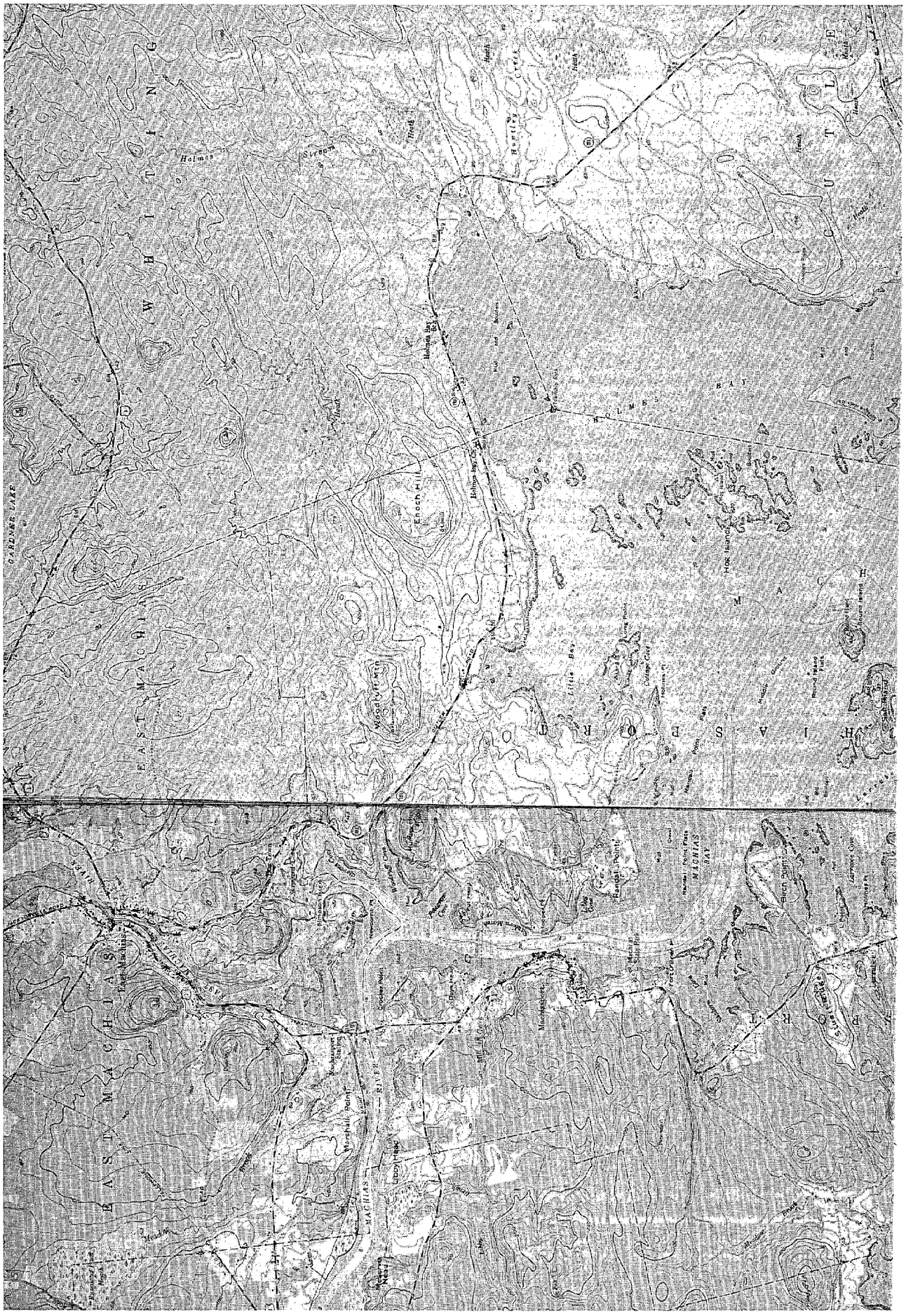
Although the above analysis suggests, in a general way, that the benefits of such a zone would outweigh the costs, a convincing quantitative benefit cost study is not possible. One problem is the absence of adequate basic data; another is the presence of too many variables. It is possible to hypothesize zones which are beneficial to the state or to hypothesize those that are not. To be of net benefit, a zone should be wisely located, should contain industries with a high potential for expansion and job creation relevant to Maine's employment needs, should prefer transportation of oil overland to transportation over water, and should be so structured as to provide maximum tax benefits to the state as a whole. If any one of these conditions is absent, the attractiveness of a zone, particularly one including oil operations, diminishes.

**Two Zones**

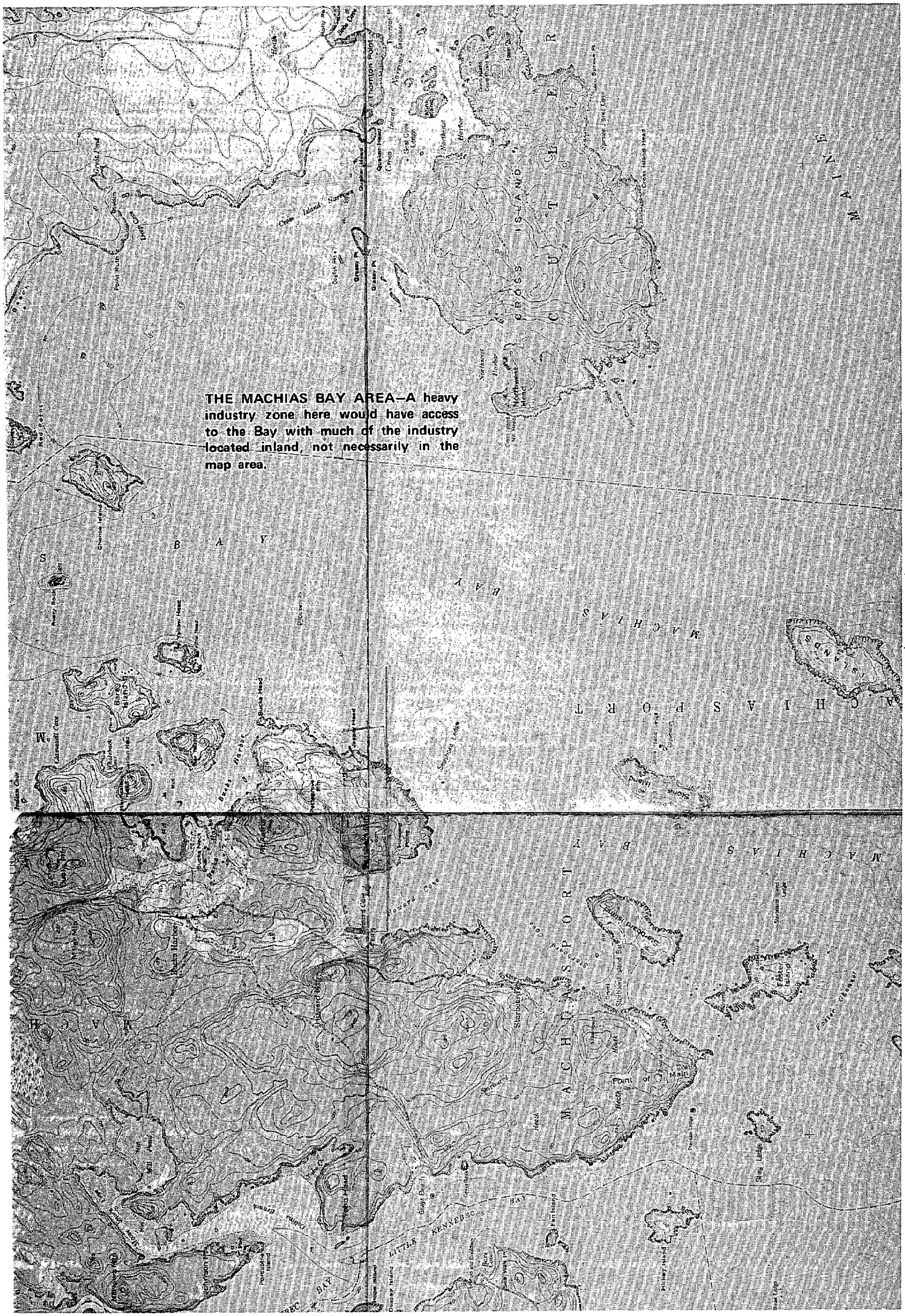
Nothing about past heavy industrial development along the Maine coast suggests that one zone would be filled to the point of overflow in the first few years. Nevertheless, there are several reasons why the state might pursue a two zone policy.

First, two zones offer more flexibility than one. It is possible that a particular industry would prefer a coastal location away from the Portland area. Under a one zone policy, such a location would also, of course, be away from Maine.

Second, assuming that both zones are eventually successful, employment would be furnished in two places rather than one to the benefit of the second location and its labor market.



EAST MACHIAS
WHITING
CUTLER
HOLMES BAY
MACHIAS BAY
Enoch Hill
Woodruff Mtn
Little Bay
Hog Island
Round Island
Birch Point
Machiasport
Marshall Point
Libby Head
Reserve Head
Holmes Bay
Huntley Creek
Holmes Stream
Heath
Meadow
Mill Cove
Crocker Point
Randall Point
Randall Point Flats
Round Island Flats
Middle Ground
Cottage Cove
Long Point
Holmes Pt
Fort O'Brien Pt
Machias State Park
Machiasport Station
Simpson Mtn
Newcomb Pt
Sawyers Mtn
Woodruff Cove
Hoodruff Cove
Mud Island
Salt Island
Larrabee Cove
Holmes Pt
Gardner Lake



**THE MACHIAS BAY AREA—A heavy industry zone here would have access to the Bay with much of the industry located inland, not necessarily in the map area.**

Third, Portland has the lowest unemployment rate in Maine. Jobs are more needed elsewhere. However, McLoughlin points out (Appendix III, p. 100) that it is unwise to count on being able to "take heavy industry to the unemployed in a situation like Maine's," at least not without a subsidy program more extensive than any the state has yet been willing to undertake.

Fourth, in the long run there is a limit to the capacity of one zone to absorb the environmental impact even of well regulated heavy industry. For example, maintaining acceptable water quality standards might limit the number of industrial plants in any one zone.

Fifth, if any of the foregoing reasons or a combination of them eventually prove well-founded, the state will be better off if it plans for the second zone from the beginning. Otherwise it will be confronted later on by higher land costs and by resistance stemming from the inevitable increase in nonindustrial activity.

The best location for a second zone would be in Washington County, almost certainly in the Machias Bay area. Washington County needs the economic boost more than any other coastal county. As the PARC study indicates, the Machias Bay area offers the best deepwater port in Washington County combined with ample available land not presently devoted to incompatible uses. Planning for the original Machiasport project in 1968 revealed that construction of necessary retail facilities would not be difficult.

Despite its sheltered harbor, better rail connections and slightly larger labor force, Eastport would rank a distant second primarily because of its more difficult approach and shallower water. In addition, development of a supertanker port at Eastport would foreclose any possibility of the building of the Passamaquoddy Tidal Power Project and an Eastport refinery would entail the complications of binational surveillance of the tanker approaches.

Other deepwater sites such as Frenchman's Bay, Bluehill Bay, or Penobscot Bay are out of the question because of their high recreation value. Heavy industry and tanker traffic could not easily be tucked into these places without harmful environmental consequences, and more appropriate sites are available.

The adverse environmental impacts in Washington County are basically the same as in Portland. However, oil in Washington County does pose four additional problems. First, Machias Bay water is mostly Class SA, the state's purest salt water classification. Tanker traffic, given the present state of spill control, is simply not consistent with this classification, and a legislative re-classification would be necessary. Secondly, there are no presently established tanker lanes in Washington County waters, and some areas now available for lobster fishing would certainly experience greater gear destruction than currently results from the Bluenose Ferry. Third, greater distances would weigh heavily against the option of a pipeline distribution system. This would force reliance on vastly increased coastal barge and tanker traffic. Fourth, to the extent that current rather than wind direction moves spilled oil, the entire Maine coast is downstream from Washington County.

As the PARC report suggests, heavy industry would have a tremendous social and governmental impact in Washington County. The types of impact would be those discussed earlier in this chapter, only more so. In formerly rural areas of Puerto Rico, Sicily, and Newfoundland sudden infusions of heavy industry have not yet proven to be a panacea for lagging economies, but the impact on rural Maine might be constructively channeled by applying "new town" techniques to the large areas of available land.

**Continuation of the Present Case by Case Approach**

A third option available to the state is to continue to judge industrial proposals anywhere on the coast on a case by case basis. A modification of this approach would be to close some areas to heavy industry while permitting applications for sites everywhere else. A further change might be to require the Department of Environmental Protection (DEP) to give weight to economic benefits which might offset environmental losses.

The strengths of this approach are that: (1) it offers a maximum of flexibility in response to particular projects, (2) it permits all relevant, updated knowledge to be brought to bear on applications on a continuing basis, (3) it tends to disperse potential polluters along the coast, thereby spreading population and employment and preventing tolerable individual emissions from cumulating in intolerable ambient results, and (4) it requires no new governmental institutions.

Its weaknesses are that: (1) it does not permit foresight, for in judging a particular proposal (a refinery, for example), the DEP cannot consider the merits of an alternative future activity such as a tidal power project or aquaculture; (2) speculation and uncertainty of the type discussed earlier would continue to flourish on the coast, and (3) the DEP, not staffed to handle a possible flurry of such applications, could find itself overwhelmed if two or three refineries applied at the same time.

It is, of course, possible that under a case by case approach interindustry economies and common sense would lead to zones similar to those already discussed, but such a result is not guaranteed. It is also possible that the refinery hopscotch that the coast has seen in the last four years would continue and that heavy industrial projects would, after costly struggles, gain some approvals which were best from the industry's point of view but, although environmentally acceptable, not best in terms of the public interest in the coastal region. Furthermore, as the recently published **Maine Manifest** and others have suggested, the uncertainties and controversies inherent in the present system may serve to discourage some desirable firms or industries which might be of benefit to Maine.

In the long run, clarifying amendments and the precedents established by prior DEP decisions would reduce the uncertainty factor, but each technological innovation, real or claimed, could force the DEP to reopen the book on particular sites.

Economic and social impacts under the case by case approach are difficult to project, particularly given that the DEP members on the Task Force do not agree as to nuances in interpretation of the Site Approval Law. The most likely result of continuing the case by case approach, assuming applications by heavy industries of the types discussed earlier, would be some oil development in the Portland area and perhaps Washington County and probable approval of some power plants and possibly paper mills, designed for minimum environmental impact, at sites chosen with at least a minimum of environmental common sense.

Economic and social impacts, while they would follow the general outlines predicted in the discussion of zones, cannot be portrayed clearly under the case by case approach. It does seem clear, however, that continuing uncertainty and speculation about heavy industry locations over the entire length of the coast would have an unquantifiable adverse impact on some of the activities which comprise the nonindustrial future.

## Chapter 3

## THE PREFERRED FUTURE AND HOW TO ACHIEVE IT

None of the alternative futures set out in the preceding section, by itself, constitutes the preferred future in our judgment. Each presents advantages but still fails to meet adequately the tests of social welfare the people of Maine deserve to have met. Consequently, our preferred future draws points from each of the three futures. We proceed now to outline this preferred future and the policies, legislation, and other activities necessary to achieve it.

Fundamentally, our preferred future is not characterized by extremism in which one set of values or point of view is allowed to dominate. Economic advancement and security for Maine people over the coming few decades requires, we think, some new industrial development, including heavy industry, to provide jobs and income. Such development, properly limited, does not threaten the light industry, tourism, recreation, and natural beauty which will predominate on the coast in any case. But too much development of heavy industry in inappropriate places would damage or threaten to damage the superlative quality of the coastal environment of land, water, air, forests, and towns. As noted earlier, the Maine coast over the last two centuries has seen spectacular and less spectacular development come and go. Its inhabitants have learned that the essential properties and characteristics of their coast must be conserved and not jeopardized in any serious or long lasting way simply to gain a quick return. Therefore, in the future we prefer, the scenery, the amenities, the charm of the coast have to be safeguarded.

### Two Heavy Industry Zones

We propose two, and only two, industrial development zones, one on the southwestern part of the coast in the Portland area and the other on the northeastern part on Machias Bay.

We feel that the Portland Harbor area is the best place for a heavy industry zone, particularly one which includes oil. By this recommendation, we do not suggest that oil spillage is tolerable in Portland Harbor. We assume that the DEP, as well as federal and local authorities, will continue to make every effort to prevent, control, and penalize such spillage.

Furthermore, we do not recommend that additional oil development be undertaken even in the Portland area until all investigations of the recent Tamano spill have been completed and necessary remedial actions taken, Specifically, our preferred future would involve preparations such that equipment and expertise would be available before the fact and would not have to be suddenly imported to Portland, presently the third largest oil port on the East Coast, from Massachusetts, New York, and California. We would also require that the navigational practices which resulted in the Tamano accident be corrected and that consideration be given to the airport-type shipping controls like those now in experimental use in San Francisco Harbor.

We feel that Maine's oil handling law, if vindicated in court, would give the state the legal and financial ability to take the necessary corrective steps, but, if oil traffic is to continue under circumstances which threaten to blacken Maine's waters and beaches while closing substantial shell fisheries, then we do not feel that that traffic should increase.

With full environmental safeguards, a Portland oil refinery, as discussed in Chapter 2, would have the most beneficial total impact for Maine of any location in the state. Portland has the necessary water depths to handle large tankers though not the very largest now being considered. Water classifications and uses in much of the harbor are not inconsistent with oil operations. Portland is the closest deep harbor in Maine to southern New England and New York markets. The Portland area can draw on a large multi-skilled labor force, and the present local and regional economy and units of government should be able to cope with additional needs for services.

Portland's primary drawback is absence of available industrial land on the shore, but adequate land can certainly be found within a twenty mile radius. If oil development does occur in this zone and if the refined oil moves to southern New England by pipeline rather than coastal tanker, a refinery located inland to the southwest of Portland is a possibility. From an environmental standpoint, the advantage of such pipeline transportation over coastal product tankers may be considerable.

A second drawback in Portland is that its approaches are not suited to the largest (more than 300,000 deadweight tons) supertankers. Extensive deepwater hydrographic work has not been done for Portland Harbor, but it is clear that, without blasting or dredging, tankers drawing more than 75 feet of water would face an extremely narrow and winding approach to any landbased pier facility.

In all probability, Portland Harbor could not be used by fully loaded vessels larger than 250,000–275,000 deadweight tons. This limit is not viewed as a serious drawback because (a) 80 percent of the supertankers in existence or on order are smaller than 275,000 deadweight tons, and (b) roughly 90 percent of the savings associated with large tankers can be realized in vessels of 275,000 deadweight tons.

A third drawback, which Portland Harbor shares with all other deepwater areas in Maine, is the probable need for legislative reclassification of some water area in the immediate vicinity of the terminal. Such re-classification would not legalize oil spillage, which would remain absolutely prohibited. However, without reclassification, the DEP might not be able to permit construction of the terminal because decisions under the Site Approval Law are closely related to the marine and recreational uses expected from the local water classifications and because the uses associated with Class SA and SB quality water would be inconsistent with even occasional small oil spills.*

Machias Bay offers access to large tracts of available land and to large quantities of deep, cold water adequate for any likely cooling requirements. It is centrally located in a part of Maine badly in need of economic stimulation. A zone in this region could have a configuration similar to the Portland zone. This would make possible the placing of large or unsightly plants and other facilities back and out of sight from the coast, nearer the main highways and rail lines.

* **A minority of the Task Force, citing the experience on the Prestile Stream and the fact that one re-classification may lead to others, opposes any lowering of water classifications in the coastal zone.**

Because it is too far from southern New England to offer any prospect of an environmentally preferable pipeline, a Machias Bay oil development could generate considerably more barge and tanker traffic than a Portland facility. In any case, it would expose much more of the coast to such traffic. Because of reservations about the present spill and cleanup record of the oil industry, coupled with the additional exposure of much of the coast to tanker traffic, the Task Force by a narrow margin recommends that Machias Bay not be developed as an oil port at this time.* Nevertheless, Machias Bay does offer the best deepwater tanker port potential aside from some areas such as Frenchman Bay which are already committed to other uses, and we feel that the second industrial zone should be chosen in awareness that the oil industry may someday, perhaps fairly soon, improve its spill prevention and cleanup technology to a point at which the state would be willing to permit oil operations therein.**

The only other area in Washington County which approaches Machias Bay in overall suitability is Eastport which is also an area of primarily Class SA water. In the final analysis, Eastport is inferior despite the advantages of a sheltered harbor, better railroad connections, and a slightly larger labor force, because: (a) the approaches and tides are riskier and many approach aspects involve the complications of joint jurisdiction with Canada; (b) the harbor could not handly very large supertankers; (c) access to the large tracts of land necessary to an industrial zone is more difficult; and (d) to develop Eastport as a major port would be to forego forever Maine's only viable tidal power site.

This is not to say that Eastport is necessarily an unsafe oil port; it is to say that, when the full public interest is considered, it is inferior to at least two other sites and we therefore do not recommend that it be developed for heavy industry.***

In the Portland based zone, oil importing and refining would be permitted along with industries related to oil; also other heavy industries such as power generation. In the second zone, oil would not now be permitted, but power generation, pulp and paper plants, and other heavier and lighter industries would be permitted. In both zones, proposed industrial operations would have to comply with all environmental standards and requirements of state, federal, and local laws and ordinances. In addition, proporals would have to meet the economic, financial, site location, health, safety, and other requirements of governmental agencies, including especially those of the agency established to administer the industrial development zones.

Each of the two zones should be demarcated with care, and unattractive facilities should not be permitted to locate directly on the coast unless absolutely necessary. We have in mind that the first zone would include parts of islands in Casco Bay, adequate deep water areas of the Bay, connecting lanes in the water and on the bottom between these offshore areas and the islands and the mainland, a land area in or near South Portland suitable for shore installations to handle oil and perhaps for the erection of industrial processing facilities, strips for transportation and utilities extending inland, and sufficient inland area for refineries or other plants.

* **A substantial minority differs with this recommendation and prefers that the second zone in Washington County be eligible for heavy industry, including oil, from the beginning.**

** **A minority of the Task Force feels that, even with coastal heavy industry restricted to two zones, Machias Bay would be unable to attract heavy industry other than oil. This minority is divided as to whether oil development should be permitted in Machias Bay.**

*** **A substantial minority of the Task Force, noting that an application for an oil refinery and terminal and Eastport may be forthcoming shortly, would suspend evaluation of Eastport in deference to the judgement of the Board of Environmental Protection.**

**Existing Heavy Industry on the Coast**

For those coastal communities already devoted in part to heavy industry we envision a continuation of existing operations with reasonable modernization and expansion from time to time to meet market needs, to permit adoption of improved technology, and to enable existing firms to remain competitive. We would permit moderate increases in heavy industry, other than oil refining, at these sites, but we do not recommend that they become heavy industrial development zones. Each proposed new facility would be subject to approval by the DEP. Expansion of existing industry would be permitted under the DEP's site approval jurisdiction as long as the expansion were devoted to producing the same or a closely related end product and as long as there is no significant additional adverse environmental impact. If in the future these operations should phase out and be discontinued, replacement heavy industry capable of sustaining employment levels should be permitted. As with expansions of existing heavy industry, any new or replacement heavy industry would only be permitted subject to the DEP's siting review.

One type of heavy industry, large electric generating plants, has characteristics not suitable for regulation under the two zone approach outlined thus far in this section. The transmission lines essential to these facilities present unique environmental problems, and these problems dictate that the miles of Maine to be devoted to transmission line corridors be held to whatever minimum is consistent with sound siting of the plants themselves. Because of the transmission line factor, the Task Force recommends that power plants be permitted to locate outside the aforementioned zones in cases where the Department of Environmental Protection finds that a specific proposed nonzone location would have a minor environmental impact or less of an adverse environmental impact than would strict adherence to the two zone approach. In short, we are recommending that power plants continue to be sited on a case-by-case basis until the state can, through advance planning, designate locations at which the environmental impact of both the generation and transmission components will be minimized.

A second type of heavy industry, mining, is also not susceptible to regulation by zone. Obviously, the location of ore is beyond state control, and mining operations must continue to be approved, rejected, and regulated on a case-by-case basis.

**The Rest of the Coast**

The remainder of the coast -- on the order of 98 percent of the total coastline of some 3,000 miles -- would not be eligible for heavy industry. We see great advantage in making this crystal clear. What are hopes to the industrial developers, threats to the environmentalists, euphoric or nightmarish dreams to local residents, and titilations to everyone in the state about big industry anywhere anytime on the coast should be laid to rest once and for all. Heavy industry, with the few exceptions already noted, is to be located in one or the other of two zones of limited extent and with careful internal controls, as outlined previously, and that's the end of it.

This overwhelmingly large remainder of the coast, in our view, should be protected and used for residences, parks, outdoor recreation, undeveloped scenic areas, summer homes, and the like. Also under existing and improved regulations, some of this very large remainder can be used for further development of coastal towns, and for light industry such as boat building, canneries, aquaculture operations, marinas, wood products manufacturing, and similar activities. In the main, these activities should probably be congregated in a relatively few places in or near towns.

As the Allagash Group report to the Task Force points out, this type of development offers considerable benefit to the state, but, uncontrolled, it can be more damaging to the environment than heavy industry.

We feel it necessary to reiterate here that most Maine coastal towns have little chance of attracting or benefitting from heavy industry. Many don't want it, and many others lack the attributes essential to such industry. Furthermore, under Maine's present tax system, a decision by a heavy industry to locate in a particular town is potentially detrimental to those neighboring towns which would share in the governmental and environmental costs with little offsetting tax advantage. By confining heavy industry to two zones and, with the exception of limited additions allowed to a few existing heavy industry sites, by excluding heavy industry from the rest of the coast, we recognize that a few coastal towns might be denied the opportunity of sharing directly in the economic benefits of such development. New jobs in these towns, additional incomes and spending, and increased local tax revenues would have to be largely foregone. To compensate for this the economic benefits of the zones can be spread up and down the coast and to the state generally through the creation of the coastal development corporation as outlined below.

**A Maine Coast Industrial Development Corporation**

Our principal proposal for implementing the two heavy industry zones is for the establishment of a Maine Coast Industrial Development Corporation by early action of the State Legislature. This agency would have basic responsibility for planning and managing the two zones. It would acquire (through condemnation if necessary) and own the land and port facilities and enter into leases with tenants. Prospective tenants would be subject to rejection by the DEP if it was not satisfied that the environment would be adequately protected. The legislature itself would have to define the zones geographically or at least specify the process for defining them.

The Corporation would have the power to issue mortgage and perhaps revenue bonds. The directors of the Corporation, up to the number set out in the authorizing legislation, could be named by the Governor, approved by the Executive Council, and could serve for overlapping terms. They should represent, in balance, the economic, environmental, and other major interests to be affected by the acts of the Corporation.

The lease terms would cover payments in lieu of property taxes to the local communities and the operating and debt servicing costs of the agency. The Task Force feels strongly that statewide sharing in the tax benefits generated by the zones can best be achieved by general property tax reform involving state assessment of all heavy industry. If, however, such general reform continues to be deferred, the agency can set its lease payments high enough to assure that local communities are reimbursed for costs resulting from the zones while some additional revenues go to the state general fund.

In addition, the lease payments could be used for any oil spill equipment necessary to the special needs of the zone and not obtainable from the DEP's coastal protection fund; and the Corporation could play a coordinating role, aggressively if necessary, in assuring that state and federal spill clean-up plans were workable and up to date.

The Corporation would be responsible for driving the best possible bargains from the point of view of the Maine public interest. These bargains would focus on such matters as investment in satellite manufacturing industries in Maine and the provision of job training programs relevant to the Maine labor force.

The Corporation would aggressively promote industrial development in the zones, but it would not be empowered to grant subsidies to particular industries. It would, however, be able to offer the attractions of available pollution control facilities, docking access, perhaps tanker traffic control, and a well managed industrial zone.

It should be noted that this proposed agency is not an entirely new approach. It combines aspects of the original Machiasport Foreign Trade Zone, legislative proposals for a Maine Area Land Development Authority and a Maine Industrial Port Authority, and recent suggestions of a Maine Land Bank coupled with community development corporations.

**Coastal Planning in General**

A final word on coastal planning, even statewide planning, is in order. Maine already has a Shoreline Zoning Act dealing with property within 250 feet of fresh and salt water shorelines. Federal legislation is now being considered by the Congress both for coastal zoning and for land use zoning generally according to which states would be required, following federal standards, to prepare land use plans and establish zoning procedures for either coastal regions or much of whole states. Beyond the commendable Natural Areas and Penobscot Bay Pilot projects already undertaken by the State Planning Office, Maine should take additional initiative in this direction, without waiting for federal law to force state action. The Task Force has been impressed with the need for continued comprehensive planning and stricter control over coastal land use, even apart from heavy industry zones, as a means for achieving a more attractive development of tourism and recreation. In any case we regard our proposal for two industrial development zones as consistent with any land use legislation likely to emanate from Congress and consistent also with further efforts of the state in the same direction. Beyond this, we think coastwide or statewide land use planning and zoning, intelligently done, would reinforce the heavy industry zoning concept and procedures outlined here by, for example, preventing random spillover of undesirable development into areas outside heavy industry zones.

## Chapter 4

## CONCLUSIONS AND RECOMMENDATIONS

In reaching its final conclusions and recommendations the Task Force was mindful of the long and varied history of resource and economic development along the Maine coast with each particular period seeing one or another of the coast's economic advantages coming to the fore and then receding. We have been conscious throughout our deliberations of the need for a long view ahead also to ensure as best we could that the most basic attributes of the coast--its superb scenery, its land and sea resources, and above all its people--continue to exist in a sustainable and productive relationship with one another. Essentially this means finding ways for the proper economic development of the coast without damaging in any essential or permanent way the quality of its resources or the attractiveness of living there. It is trite to call for balanced development, but we think we may have earned the right to use this term as a result of having analyzed carefully a number of alternative futures and, in the preceding chapter, having specified the kind of future we prefer.

Our main emphasis is on a zone approach to the future of the Maine coast in which heavy industry and, to a considerable extent, the related lighter industries would be concentrated, leaving the rest of the coastline, perhaps as much as 98 percent of it, free of heavy industry and dedicated to other uses. This approach, we believe, will avoid much uncertainty and many mistakes in the location of industry on the coast. We favor two such zones, each one carefully delineated and well planned for industrial development. On the sensitive matter of oil transshipment and refining we conclude that the best location is in the Portland-Casco Bay area although even here we would want to make sure that necessary actions were taken to give greater protection against any recurrences of the recent spill. The second zone that we recommend is in the Machias Bay region and here we would want to proceed cautiously, if at all, in the matter of oil development so that the high quality water and natural environment will be protected.

The instrument we propose for managing the two zones is a Maine Coast Industrial Development Corporation. The Corporation would be expected to proceed vigorously in attracting suitable heavy and other industries to the zones and would be responsible for the internal arrangement and management of all the facilities in the zones. Site approval for plant locations in zones would have to be secured from the Department of Environmental Protection, just as at the present time. The Corporation would be concerned with fiscal effects of zone development on nearby cities and towns and would place major emphasis on the jobs and economic benefits to be secured. In addition, the Corporation would have a special eye for environmental effects within the zone.

Our more specific conclusions and recommendations follow.

### CONCLUSIONS

1. Properly controlled heavy industry at a limited number of sites would add a desirable balance to Maine's economic base and job opportunities and would not threaten the growth of the nonindustrial and light industrial activities which will continue to predominate on the coast. Such controlled location of heavy industry would actually facilitate rather than threaten the necessary planned preservation of coastal open space and recreation on nearly all of Maine's 3,100 miles of coastline.

2. Properly controlled heavy industry does offer considerable economic benefit to Maine in the form of jobs, taxes, and products. The likelihood and volume of such industry in Maine is uncertain, but some such growth appears probable enough that the state must prepare for it.

3. Uncontrolled recreational growth poses at least as much of an environmental threat to most of the coast as controlled heavy industry.

4. The exclusion of heavy industry generally and oil refining in particular from the entire coast is neither necessary nor wise. Oil refining and transshipment are the only imminent activities for which a plausible case can be made for total exclusion, but the Task Force concludes that the benefits to the state outweigh the costs to the state if the oil operations are part of a properly planned and regulated heavy industrial zone in the Portland area. (A substantial minority of the Task Force feels that the benefits of oil would also outweigh the costs in a Washington County zone.)

5. The establishment of heavy industry zones is feasible and, coupled with firm control of non-industrial sources of coastal degradation,offers the best opportunity for Maine citizens to realize in a balanced way the potential benefits of their entire coast.

6. To be clearly of net benefit to Maine, any zone development involving oil should be located with careful consideration for the environment and should be subject to all relevant DEP approvals and licenses. Oil spill clean-up plans, equipment, and expertise should be immediately available. Any such zone should have at least a strong possibility of generating jobs for Maine people, attracting satellite industries beyond a refinery alone, and should stress pipeline transportation of oil to out-of-state markets in preference to transportation by tankers or barges. The financial management of a zone should result in the distribution of some tax benefits to the state in addition to covering any costs imposed on surrounding localities. A refinery not meeting these conditions would be of dubious net benefit to Maine. A major oil transshipment terminal unrelated to a refinery would be extremely difficult to justify.

7. Continuation of the case-by-case site review method, particularly with heavy industry excluded from some areas, is a workable way to control heavy industry along the coast. However, while this method is a satisfactory defense against disastrous land use mistakes, it provides no assurance that the best heavy industrial sites from a public interest standpoint will be the ones actually developed. In addition, the strict case-by-case method inserts an unsettling element of uncertainty into the efforts of industry, conservationists, and the general public to enjoy the coastal resources of the entire state.

8. New power plants should be encouraged but not required to locate in heavy industry zones. Because the environmental advantages of placing power plants in controlled zones might be more than offset by the environmental damages of long transmission lines, it would be acceptable for power plant sites to continue to be approved on a case-by-case basis as at present. Similarly, approval, rejection, and regulation of mining operations must continue to be handled on a case-by-case basis.

## RECOMMENDATIONS

1. New heavy industry in the coastal zone should be confined to two zones, one in the Portland—Casco Bay area and one in the Machias Bay area, except as noted hereafter.

2. Oil development should for now be limited to the Portland area zone, and deferred even there until corrective action in light of the Tamano spill has been taken with regard to navigation, training, and equipment stockpiling. Oil development in the Machias Bay zone should be deferred until Maine has greater reason to believe that spillage can be prevented and contained.*

3. Maine should develop a comprehensive system for maximizing the benefits and minimizing the harms which flow from the light industrial and nonindustrial growth on the coast.

4. Responsibility for developing and managing the heavy industrial zones should be vested in a Maine Coast Industrial Development Corporation.

5. The Maine Coast Industrial Development Corporation should be empowered to borrow money and issue bonds, to acquire the land necessary for zones, to construct and own such facilities as piers, and to charge such lease fees as will enable it to cover its fixed charges and operating costs and to make payments in lieu of taxes to affected municipalities.

6. Comprehensive property tax reform would be the best way to distribute the benefits of these zones statewide but enlarged lease payments may achieve the same end if property tax reform continues unimplemented.

7. The DEP should have the power to review proposed zone projects and approve them with any necessary conditions or reject them, and zone projects should be subject to all applicable air and water discharge laws, and any zone involving oil should be prepared in advance to deal with oil spillage.

8. Power plants should be exempted from zone locations if the DEP is satisfied that a proposed alternative is less environmentally damaging than location in a zone, and mining operations should continue to be handled case-by-case.

9. Limited new heavy industry, other than oil refining and transshipment, should be permitted in coastal areas where heavy industry now exists, provided that the DEP is satisfied as to the siting and emission controls of such industries and provided that these areas remain relatively modest in scope and not be permitted to become full scale heavy industry zones.

10. Maine, both in furtherance of its own interest and in anticipation of possible federal steps, should continue to emphasize data gathering, planning, open space preservation, and careful control of all types of development on the coast.

* **The limitation on oil in Machias Bay was preferred by a narrow majority of the Task Force.**

APPENDIX I

**A Report to**
**The Governor's Task Force on Energy,**
**Heavy Industry, and the Maine Coast**

# HEAVY INDUSTRY ON THE MAINE COAST

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## INTRODUCTION

This paper examines the probable course and consequences of new industrial development on the Maine Coast. In order to so examine, we postulate a "substantial" expansion of such activity involving specific changes as set forth below. Our method is first, to see what types of development are most likely to occur (and where), and second, to identify the major benefits and costs associated with such development. The time horizon is roughly twenty years. Where certain types of benefits or costs have essentially "timeless" dimensions, however, these too are considered. Finally, an attempt is made to see whether, or to what extent, benefits and costs are sensitive to policy controls; that is, the extent to which specific policies can enhance benefits, reduce costs, or both.

In this paper, discussion has been limited primarily to "heavy" industry, which has been defined as capital-intensive enterprises requiring substantial inputs of bulky raw materials, fuel, electric power, and water. Examples include plants producing petroleum, electric power, pulp and paper, industrial chemicals, glass, cement, primary metals, and ships.

## I. PROBABLE INDUSTRIAL DEVELOPMENT ON THE MAINE COAST

### A. History of Development on Maine Coast

During the 19th century Maine's economic advantage--and thus its ability to export to a rapidly expanding national market--lay in an unusual combination of resources: forested lands with varied wood types; rivers with fall lines near the ocean; some good though specialized agricultural land; an available supply of labor, largely from French Canada; and a deeply indented coast line with good harbors and access to plentiful fishing grounds. Reflecting these attributes, the economy was based to a very large extent on the forest products industry, shipbuilding, textile manufacture, fishing, and a few specialties such as ice, potatoes, and dairy farming.

By the early part of the 20th century some of these activities had begun to fade (e.g., shipbuilding) or had disappeared entirely (ice export), and were being supplanted in turn by seasonal residences (both cottages and mansions) accompanied by some shifts in manufacturing (e.g., toward leather) and an array of service industries including tourism, finance, transport, and real estate. Some of the older activities, on the other hand, still prospered and were expanding, as evidenced by forest products (now including paper) and agriculture (now including poultry).

In the late 20th century we observe forest products continuing as a basic source of economic support. Most (not all) of the other "products" industries have declined, while the service industries (now including tourists and general recreation) have expanded very rapidly. Like others before it, the recreation industry rests on a rather unique resource base--one that has been redefined to meet higher incomes and new patterns of demand. Leather products--still the state's largest manufacturing employer--have held their own until very recently. But it now looks as though the state will see its manufacturing sector undergo further relative shrinkage leaving, aside from forest products, what are essentially a few specialty producers in each of a dozen fields--including the traditional ones of shoes and shipbuilding.

### B. Future Probabilities

While a relative shrinkage of the manufacturing sector characterizes the national economy as well, there are at the same time instances of rapid and sustained growth in industrial activity. Several of the so-called energy industries are notable examples of this growth. In transportation, both containerization and air freight show a similar trend. The nature of technology in the energy field, moreover, permits generating locations at some considerable distance from both markets and raw materials. One of the basic questions facing Maine is whether it wishes, or will be able, to take advantage of this type of growth. And, in order to answer the question, one has to examine exactly what the state has to offer... Why would any of the "growth" industries, energy or otherwise, locate here?

As we see it, the basic physical advantages of the state include the following:

1. its unusual coastline: deep harbors, deeply indented, rugged shorelines;
2. its forests and mountains and rivers--interspersed with small centers of civilization--which not only support some of the traditional industries but increasingly furnish amenity to a high income, congested society;
3. its proximity to two regions (markets) occupied by such a society: southern New England and the St. Lawrence Valley.

By implication, we do not see Maine as having any unique advantage with respect to labor, capital, or national markets. While we believe both Bangor and Portland will continue to enlarge their roles in air transport and a broad spectrum of other services, it is difficult to see these activities as providing any considerable export base. (The Bangor airfield is obviously a great asset, but it is really too early to tell whether its development will make a substantial difference to the Maine economy.) On the other hand, there is some possibility that Maine can utilize existing transport connections to service a growing regional-overseas trade.

Between 1960 and 1970, manufacturing employment along the Maine coast rose 5.2%--to a total of 60,647 persons in the latter year. Those industries which increased their employment substantially during this period included electrical equipment, machinery and ordnance, fabricated metals, rubber and plastics, printing, and stone, clay and glass products. Smaller increases were registered by the paper, leather, and primary metals industries. Declines occurred in foods, textiles, apparel, lumber and wood, furniture, and transportation equipment (mainly shipbuilding).

Tentative unpublished employment projections for the entire state which were prepared by the Maine Employment Security Commission indicate changes between the years 1969 and 1980 of the following relative magnitudes: total employment +12%, agriculture -52%, forestry and fisheries -17%, manufacturing +8%, contract construction +34%, transportation and utilities +6%, wholesale trade -3%, retail trade +7%, finance and insurance +20%, services +30%, and public administration +24%. Within manufacturing, substantial (over 10%) increases are anticipated in furniture, primary metals, rubber and plastics, machinery, stone, clay & glass products, chemicals, apparel, leather, fabricated metals, miscellaneous products, printing, and electrical equipment. Smaller increases are expected in paper and foods, while declines are likely in textiles, transportation equipment, and lumber.

Although industrial location decisions are dictated mainly by markets and production or resource costs, investments, taxes, and controls by various federal, state, and municipal agencies often can influence the establishment or expansion of individual firms in particular locations. However, in the case of ' 'heavy" industries requiring massive capital expenditures, the primary determinants of decisions to locate in Maine will be the various current resource and market factors.

On this basis, the most likely prospects for future expansion of "heavy" industry along the Maine Coast appear to be petroleum refineries, nuclear (and possibly fossil-fueled) electric generating plants, and perhaps another integrated pulp and paper mill. The Maine coast offers unusual advantages for the location of these segments of the energy-producing and using industries. Harbors are deep, water is cold, land is still available, and the relevant (regional) markets are mostly within 300 miles.

While it is true that Maine's "amenity" advantages may increasingly attract some firms--those, for example, which are not particularly sensitive to transport costs--we doubt whether they will be sufficient to account for any great manufacturing relocation. We are aware of no visible, or audible, demand for Maine coastal locations on the part of a majority of manufacturing industries. On the other hand, the presence of one or more components of the energy industries might conceivably act as a magnet and serve to offset other locational disadvantages for that type of industry dependent on oil, electricity, or simply waste heat. Petrochemicals and process-steam firms are possible examples.

We conclude that these types of industry are most likely to be attracted to Maine, and to the Maine coast in particular. The following analysis of costs and benefits will assume such a pattern.

## II. PROBABLE LOCATION OF HEAVY INDUSTRY ON THE MAINE COAST

### A. Recent History of Port Development

Since World War II, cargoes handled by Maine's ports have increased from 8.7 million tons (in 1947) to 33.0 million tons in 1970. 99% of this waterborne commerce is now concentrated in only three ports: Portland (30.0 million tons), Searsport (1.0 million), and Penobscot River (Bucksport to Bangor - 1.8 million). Portland's waterborne tonnage in 1970 consisted of 23.0 million tons of crude oil imported for the Canadian pipeline, 5.3 million tons of petroleum products received for consumption in a large part of the state, 934,000 tons of petroleum shipped to other ports, and only 217,000 tons of various dry cargoes received. During the same year, Searsport received 705,000 tons of petroleum products, 212,000 tons of nonmetallic minerals, and 53,000 tons of chemicals, ores, and foods, while the port exported 32,000 tons of paper. In 1970, the Penobscot River ports received 1.6 million tons of petroleum products and 69,000 tons of nonmetallic minerals and chemicals, and shipped out 76,000 tons of petroleum. It can be seen from the above figures that Maine's port commerce is largely dependent on petroleum transhipped to Canada or consumed by the state's industries, homes, and vehicles.

It is our opinion that the future growth of Maine's ports will be related to two major factors--(1) the increasing need for fuel by all classes of user, and (2) the raw materials requirements and shipment of finished products by any new heavy industries established on the Maine Coast. At this time, we do not forsee the development of container transshipment in Portland or in other ports within the state because of competition with existing container services in New York, St. John, and Halifax, as well as potential facilities in Boston.

Within the last decade, manufacturing employment has grown significantly in the following economic areas of the Maine Coast: Biddeford-Sanford, Portland, Bangor-Old Town, Ellsworth-Bucksport, and Calais-Baileyville. During the same period, employment by industrial firms in the Kittery, Bath-Brunswick, Augusta, Rockland, Belfast, Jonesport, Machiasport, and Lubec-Eastport areas declined. It must be stressed that at present only a very few industries (principally paper and other users of chemicals) situated along the coast actually depend on waterborne shipping (except for fuel).

### B. Physical Limitations of Harbors

At present, oceangoing dry cargo freighters enter only two ports in Maine--Portland and Searsport--both of which have channels with a minimum depth of 35 feet. (The channel to the pipeline pier in South Portland is 45 feet deep.) The largest tankers now being employed in the world-- of about 300,000 deadweight tons and 80-foot draft--cannot tie up at any pier in the state at this time.

However, Maine is blessed with the deepest waters close to shore of any state on the Atlantic coast. In 1968 Arthur D. Little, Inc. was commissioned by Atlantic World Port, Inc., to investigate harbors suitable to accommodate supertankers serving a potential petroleum refinery on the Maine coast. They identified 13 harbors whose depth (minimum of 80 feet), tidal currents, climate, and coastline appeared most promising for this purpose. (See Table on following page.)

Without going into details, the study indicated that six of the thirteen locations would (or might) be able to accomodate more than strictly oil traffic. In other words, only six were seen as suitable for general cargo, or for bulk cargo beyond that which could support a single-purpose refinery or electric generating plant. While it would be unwise to assume, therefore, that the other seven locations could not become the site of some development, it would appear that joint use by oil and other industry would require one or more of the six preferred locations. These six are Eastport/Quoddy, Machias Bay, Frenchman Bay, Boothbay/Southport, Sheepscot Bay, and Portland. Neither the east nor west sides of Penobscot Bay were considered to be in the preferred group, largely because of their considerable exposure and lengthy, "poor" approaches. Again, however, this in itself would not preclude their use for petroleum or other terminals or for electric generation sites.

Within the six, Eastport and Boothbay were considered marginal. In Eastport's case, strong tidal currents and narrow approaches (through Canadian waters) were regarded as major shortcomings. Fog was also considered a significant hazard, although Eastport shared this problem with many other sites. The Boothbay area was not studied in detail, presumably for reasons other than natural physiography and hydrography (see below). Long Island in Portland harbor, on the other hand, was given considerable attention, and apparently the limited depth (70-80 feet) and somewhat difficult approaches did not preclude its remaining a viable candidate on natural criteria.

**C. Existing Land Use Limitations**

The A. D. Little report virtually wrote off the central portion of the coast (Cape Small to the Schoodic Peninsula) on grounds that its residential and tourist character would, as a practical matter, prohibit any major industrial development. This may seem to have been an unduly restrictive view of the subject, particularly when it was known that mills and terminals had for many years been in existence at Bucksport and Searsport, not to mention the shipyard at Bath or the industrial activity at or near Rockland. On the other hand, new industrial development involving oil does imply far more than terminal operations of the sort now existing in Penobscot Bay. No one assumes a new refinery on the Maine Coast will be limited to producing for Maine's own needs. Indeed, it is likely the refined output would augment supplies in the northeastern United States generally. Given both the economic advantage of large-scale bulk shipments of inbound crude and the possibility that a refinery would spawn ancillary industries, the Little study decided that level of activity was inconsistent with present land and water uses--primarily seasonal homes, salt water recreation, and fishing--of the mid-coast region. The result was to focus on Machias and Portland where, presumably, industrial activity was consistent with existing land use.

## POTENTIAL LOCATIONS FOR A DEEP WATER PORT

| Port | Location | Size Oil | Size Other | Protection | Breakwater Required | Approach | Land Use | Land Area |
|---|---|---|---|---|---|---|---|---|
| Eastport/ Quoddy | Friar Roads | X | Maybe | Good | No | 6 miles; excessive tides; narrow | populated | limited steep shoreline |
| Little River Island Bay | Cutler-Fairy Hd. | X | No | Poor | Yes | direct from open sea | undeveloped | reasonably level |
| Machias Bay | Libby-Stone Island | X | X | Fair Open to E & NE | No | 2 miles; deep, straight | undeveloped | level |
| Schoodic Peninsula | South of Mark Island | X | No | Open to S & SW | Yes | 1 mile; good | Winter Harbor; across from Bar Harbor, next to Acadia National Park; tourist | limited level land on coast |
| Frenchman Bay | Stave Island | X | X | Good | No | 4 miles; deep | 3 miles from Bar Harbor; tourist | Stave Island level area |
| Blue Hill Bay | Jim Point Long Island | X | No | Good | No | 15 miles; narrow spots | residential, tourist | even slope limited area |
| East Penobscot Bay | Cape Rosier | X | No | Open to S & SW | Yes (limited) | 27 miles; poor | tourist | steep shore; limited area |
| West Penobscot Bay | Frohock Point | X | No | Open to E & SE | Yes (limited) | 24 miles; poor | tourist | steep shore |
| Muscongus Bay | New Harbor Long Cove | X | No | Open to E & S | Yes (limited) | 8 miles; good | residential; tourist | limited area; slopes high flat plateau |
| Johns Bay | Rutherford Island | X | No | Open to E & S | Yes (limited) | 7 miles; fair | residential; tourist | limited area; slopes |
| Booth Bay | Southport Island | X | Maybe | Open to S | No | 6 miles; good | residential; tourist | reasonably level |
| Sheepscot Bay | Harison Harbor | X | X | Open to S & SE | No | 6 miles; good | tourist | fairly steep shore |
| Portland | Long Island | X | X | Good | No | 9 miles; fair | industrial; residential | level; limited |

**SOURCE:** A. D. Little, Inc.

As long as oil is the industry in question, we agree with this judgment. And, to the extent that new heavy industry implies at least an oil refinery, we believe there is no point in further considering the mid-coast area as a permissible site.

The question of compatible land use is also relevant at Machias and Portland, however. For Boothbay, Penobscot Bay, and Mt. Desert Island are only purer examples of the general emphasis on seasonal solace, recreation and fishing found all along the Maine Coast. The fact that Machias and Eastport are not (yet) summer Meccas simply argues that fewer people have as yet ventured that far for their motel or their own piece of land. But since many who have taken the trouble to investigate regard the eastern area as the most beautiful of the entire coast, it hardly seems consistent with prospective land uses to establish an oil refinery in such a location. Machias Bay may possibly remain a candidate by virtue of its unusual harbor and its cannery and military facilities, particularly if the refinery itself could be located inland, but the cost in terms of foregone future uses should be recognized.

Portland harbor may well be the only place on the coast where existing land uses could tolerate a refinery or combined energy-industry installation. One problem here, of course, is that the deep water extends only to (or near) Long Island instead of to the existing oil terminals in South Portland. Fortunately, that island is less important to (and less used by) seasonal and year-round residents than many others in Casco Bay. Thus, it might be possible to off-load tankers in the proximity of Long Island, yet have the refinery in or close to the present industrial zones, or well inland for that matter. While the low water classification of Portland harbor itself would not have to be downgraded to accommodate new tanker traffic, there would have to be a change in classification at Long Island.

This is not to say there are no problems at Portland with respect to compatibility with present land and water uses. Land values are relatively high in the area; there is not very much that could be easily acquired by a would-be refiner; and population densities are among the highest in the state. Portland, moreover, has the lowest rate of unemployment of all New England metropolitan areas. Even so, it appears that Portland is much the strongest candidate for new industrial activity on the particular criterion of compatibility with existing activity.

**D. Distance from Markets**

It seems to us that considerations of distance from markets reinforce those of physical and existing land use limitations. Portland (Casco Bay) has a major advantage in terms of its location with respect to both Montreal and southern New England. While transport connections are reasonably good from upper Penobscot Bay (given the proximity of highways, the Bangor and Arrostook railhead, and the Bangor airbase), this location still suffers from a comparison with either Portland or St. John, New Brunswick. It is not at all clear that we can talk realistically of a new energy or transshipment center on the central coast when Portland is so much closer to southern New England, and when both Portland and St. John have excellent connections to Canada. It is true that this criterion might not be relevant for an oil operation depending entirely on water shipment, inbound and outbound. But our initial assumptions look to a more thoroughgoing type of industrial development than that. Accordingly, we think Portland, or the Casco Bay area generally, enjoys a major advantage under this heading.

## E. Ranking of Location Alternatives

If the above criteria are sufficiently comprehensive to take in the relevant variables determining location, it would seem that Portland has a clear advantage from the standpoint of both feasibility and impact, Distances to markets are moderate, transport connections are excellent (including access to the Maine Turnpike, the Montreal pipeline, and the regional electric power grid), considerable industrial activity is already a part of the scene, and physical attributes of the harbor are reasonably partial to further development. The most important disadvantages appear to be the high price of land, the negative environmental and aesthetic impact in a metropolitan area, and the apparently lesser need for employment- and income-generating industry here than farther downeast.

The second ranking alternative would seem to be a location in Washington County--probably though not certainly Machias Bay. Here the income and job situation is critical, even in the face of low population density. Deep water approaches are unusually good, at least at Machias. And land prices remain relatively low except for shorefront property. Thus, the principal weaknesses of a Portland location are the principal strengths of a location Downeast. Unfortunately, some of the other criteria are not met by such a location. Transport connections are poor (except by water), and distances are such as to raise substantially the cost of pipeline movement, rail or highway freight, and electric power transmission. Existing (and prospective) land and water uses at Machias would almost certainly be adversely affected by industrialization, though possibly less than in other downeast harbors. Locations other than Machias are apt to have problems of the sort mentioned previously under physical limitations. They may also have political problems, although it is not clear at this time whether the Canadians would be willing to subject their (major) part of Passamaquoddy Bay to the risks of a U.S. refinery--when they have already made their decision to concentrate oil and other industry 50 miles down the coast.

As to a third location alternative, we cannot identify it at this time. To the extent that we are concerned in this paper with "substantial" industrialization, and to the extent that such a move would involve petroleum and perhaps ancillary industries, we doubt whether any other location is in fact suitable. In what follows, therefore, we look at the possible benefits and costs of these industries on the assumption that the most likely locations are either at Portland or Machias.

## III. PETROLEUM AND RELATED INDUSTRIES

### A. Benefits--Identification and Measurement

Because of rapidly accelerating national demand for petroleum products, increasing dependence on imports and the lack of harbors sufficiently deep to dock supertankers on the Atlantic Coast outside of Maine, it appears likely that petroleum refineries will continue to be proposed for this state over the next 20 years. Assuming that a proposed refinery could meet the air and water quality standards of the Environmental Improvement Commission, state-administered land-use controls would appear to be the only viable means of restricting its construction to certain areas or of preventing it from being built at all.

For the purpose of this analysis, we have postulated the establishment of a large petroleum refining complex in either an urban or a rural community on the Maine coast. For the urban setting, we have selected the city of South Portland (population 23,267) because of the availability of substantial tracts of land zoned for industry on tidewater, the presence of existing oil traffic, and a location in the largest metropolitan area in the state (population 141,625) with sizable retail markets, labor force, and services. Among the coastal rural towns in which refineries or other heavy industries have been proposed in recent years are Searsport (population 1,951), Trenton (392), Machiasport (887), Perry (878), and Eastport (1,989). We have chosen Machiasport for our example, primarily because of its superior harbor and central location in a low-income county.

1. Effect on Employment and Income

For the purposes of discussion, it will be assumed that petroleum refineries producing either 100,000 or 300,000 barrels per day will be established in either South Portland or Machiasport. The direct and indirect economic effects of the refinery will be measured within the respective economic areas of the two communities. The Portland Economic Area (Portland-South Portland Standard Metropolitan Statistical area) includes the municipalities of Portland, South Portland, Westbrook, Falmouth, Cape Elizabeth, Cumberland, Gorham, Scarborough, and Yarmouth. The Machias Economic Area (population 5,777) encompasses the towns of Cutler, East Machias, Machias, Machiasport, Marshfield, Roque Bluffs, Whiting, and Whitneyville.

**Direct Impact.** The current work force in the Portland Economic Area totals 74,000, of which 3,400 (4.6%) are unemployed, 13,200 are employed in manufacturing (principally paper, foods, electrical machinery, fabricated metals, and leather products), and the remaining 57,400 are employed in the various service industries (wholesale and retail trade, business and professional services, government, finance, transportation, and construction).

The addition of an average workforce of about 770 construction workers for 18 months to build a new 100,000 barrel per day refinery in South Portland, or 1,400 workers on a 300,000 barrel plant for 21 months, would have a major impact on the present employment (3,600) in the construction industry of that area. Although most of the land preparation, foundation, carpentry, and basic steel erection for the refinery presumably could be undertaken by construction workers already in the area or elsewhere in the state, it is likely that much of the electrical, pipe-fitting, and welding on the extremely complex machinery would be carried out primarily by skilled employees brought in from elsewhere, due to the insufficient supply of such workers in Maine. The addition of an average of 260 "imported" workers on the smaller refinery and 700 on the larger one would increase existing construction employment for 1 to 2 years by 7-20% and the total labor force of the area by about 0.5-1%. Practically all of the specialized equipment installed in the refinery would be purchased outside of Maine, since it is obtainable in only a few areas of the world (mainly Texas and Japan).

After completion of the refinery, the operating work force would consist of from 124 to 175 persons, who would be employed directly in the refinery and at the marine terminal and other ancillary facilities. It is likely that about two-thirds of the personnel hired by the smaller refinery and half by the larger one initially would be present local residents who would be trained by the oil company. In addition, from 75 to 150 outsiders would be brought in under contract for periodic maintenance on the refinery. The "imported" workers therefore would raise the area's current manufacturing employment by 1-2% and the total labor force of the area by less than 1%. It should be noted that ultimately many Maine residents probably would undertake the intensive training necessary to operate the complex machinery of a refinery, so that its economic impact on the community would rise over a period of years.

Within the Machias area, on the other hand, the economic impact of a new refinery would, of course, be considerably greater. The current work force consists of only 2,400 persons, of whom about 200 are unemployed, 215 work in manufacturing (principally foods and textiles) and the remaining 2,000 persons are employed in agriculture, fisheries, trade, and the various other services. Although many of the present labor force (employed or unemployed) presumably could be hired as construction workers by the refinery, it is likely that about 260 out-of-state workers would be hired to build the smaller refinery and 700 the larger one, thereby raising the total labor force of the area by 11-29% for several years. After construction of the refinery, the addition of 41 to 87 highly skilled outsiders to operate the machinery would raise present manufacturing employment by 19-40% and would increase the total labor force by 2-4%. It is presumed that most of the employees of the marine terminal and auxiliary facilities would be obtained from the area.

The effect of a new petroleum refinery on the **personal income** of an area in Maine is considerably greater than on its employment, due to the fact that wages of both construction and operating personnel at refineries are much higher than average wages throughout the area. (National construction wages averaged $8,054 in 1970, while wages in petroleum refineries averaged $12,764 in 1967.) Income earned by workers constructing the postulated refinery would total $9 to $11 million (at the national average wages) during the building period (or about $6 million per year) while annual personal income derived from refinery operations would total approximately $1.6 to $2.2 million per year. Injection of these amounts into the economy of the Portland area would raise its total annual personal income (estimated at $505 million in 1969) by over 1% during construction and less than 1% during the subsequent operation of the refinery. Within the Machias area, however, annual personal income (estimated at $14 million in 1969) would be increased by 43% during construction and 11-16% during the operation of the refinery.

**Indirect Impact.** According to the national input-output table for 1963, for every $100 of output by a petroleum refinery, the following direct inputs are needed: $44.94 for crude petroleum and natural gas, $1.60 for maintenance and repair construction, $2.66 for chemicals, $7.43 for other petroleum refinery products, $4.42 for transportation and storage, $1.79 for utilities, $1.82 for wholesale and retail trade, $1.92 for real estate and rental, $2.23 for business services, $3.37 for imports of goods and services, $23.36 for value added by manufacture (principally wages, taxes, and profits), and $4.46 for all other products and services. Although neither the Portland nor the Machias area has oil or gas wells, refineries, or chemical plants capable of supplying a petroleum refinery, part of the above services (e.g. storage, utilities, and real estate) would be provided locally. These local services might approximate 5% or $7.5-$15.0 million of the total value of the refinery's output (estimated at $150 to $300 million per year).

Purchase of the above products and services by a refinery also has indirect effects which are widely diffused throughout the economy of the area where they are purchased. The firms and persons supplying these needs in turn spend the added income on new supplies, their living expenses, etc. Likewise, every business establishment and household depends on petroleum products for fuel, while various chemical industries also require petroleum as a raw material. (In 1963, 11.4% of the intermediate output of all refineries was used in the production of various chemicals, plastics, synthetics, drugs, cleaning preparations, and paints.) It is possible that certain of these petro-chemical industries might wish to establish new plants near a new refinery in Maine, the likelihood of which event will be analyzed in a subsequent part of this report.

The use of "multipliers" to estimate the indirect economic impact of a particular industry is fraught with considerable peril, due primarily to the lack of adequate local data on interindustry transactions. Nevertheless, examination of several multipliers already derived in Maine may be productive. David H. Clark and John D. Coupe of the University of Maine estimated the following employment multipliers for several industries existing in the Bangor area during 1963: textiles-1.55, paper - 1.86 and leather - 1.33. Steven J. Weiss and Edwin C. Gooding of the Federal Reserve Bank of Boston estimated the following employment multipliers in the Portsmouth-Kittery region during 1966: Pease Air Force Base - 1.4, Portsmouth Naval Shipyard (civilian employment) - 1.6, and private "export industries - 1.8. Although it is uncertain whether any of the above multipliers could be applied to a petroleum refinery in Maine, we will estimate a multiplier of 1.8 in the Portland area (where there is a fairly wide range of available goods and services) and 1.3 in the Machias area (which is relatively devoid of service industries). On this basis, direct and indirect employment due to the operation of a new refinery in the Portland area would approximate 223-315 persons, or less than 1% of the existing labor force. Direct and indirect employment due to the refinery in the Machias area would be about 161-228 persons, or 9-13% of its current work force.

2. Impact on Tax Base and Public Revenues

The construction of a large new refinery would, of course, be a property tax bonanza for the municipality in which it was located. If we assume that the full value of land and structures related to the refinery is $150 to $300 million, then the assessed value of the plant in South Portland would approximate $120 to $240 million at current ratios. The City's present assessed valuation of $138.2 million would be raised 87-174%, and the mill-rate would fall from 42 to 22 or 15 (assuming no change in municipal expenditures of $5.8 million). However, it is likely that roads and utilities serving the new refinery would have to be augmented, and that schools and other public services would have to be provided for the families of a sizable though indeterminate share of the refinery workers (some of whom might choose to reside in other municipalities).

In Machiasport, the tax impact of a new refinery would naturally be greater than in South Portland, with its much larger tax base. At current ratios in Machiasport, the $150 to $300 million refinery would be assessed at $113 to $225 million--75-150 times the present assessed valuation of only $1,486,000. If present town expenses of $60,939 were not increased, the millrate would fall from 41 to 0.4-0.8. However, in the event a new refinery were constructed in Machiasport, substantial municipal outlays would be required for feeder roads, water and sewer facilities, fire and police protection, schools, and other services. It is likely that substantial numbers of new workers would choose to live in Machias and other adjacent towns, which would incur added expenditures for roads, utilities, and schools, but would receive no property tax revenues from the refinery. However, Machias would benefit indirectly from augmented retail sales and receipts for services, whereas Machiasport has few stores or services at present.

A new refinery would be subject to the State corporate income tax of 4% on net income earned in Maine. Employees of the refinery also would be taxed by the State on their personal income, retail purchases (except food), etc. However, only a small portion of these State tax revenues would be returned to their town of residence for support of public schools or other statutory purposes. If the State Courts eventually modify the present property tax system as an inequitable source of income for public schools, then there presumably will be more reliance by the towns on sales and income tax returned by the State. Until a specific decision is rendered by the Courts, it is difficult to speculate on the drastic changes it would require in municipal finance.

3. Impact on Fuel and Power Costs in Maine

**Refinery Products.** The construction of a new petroleum refinery on the Maine coast would not necessarily lead to lower fuel oil prices in this state or elsewhere in New England. If the refinery were operated by one of the "standard brands" now marketing in this area, it is highly unlikely that the present worldwide system of administered prices would be altered. If the refinery were built by an independent producer who was anxious to penetrate the New England market, then it is more likely that present prices would be undercut. Large users of fuel oil, such as the electric and paper industries, would be in the best position to bargain for lower prices.

3,966,000 barrels of residual oils (plus 371,000 barrels of distillate fuel oils) were used by all industry in Maine in 1969, as reported by the Bureau of Mines. (However, the Task Force on Industrial Fuel Oil Supply in Maine estimated industrial consumption of residual oil at about 12 million barrels.) At the average refinery (wholesale) price of $2.44 in Portland, the residual oils represented a total expenditure of about $9.7 million (or possibly $29 million) by the state's industries. Because that figure constituted only 0.4% of the total value of manufactured products for 1969 (or 1% of total value added by manufacture), it is obvious that even a major reduction in fuel prices would have induced very little change in the total cost of producing goods in Maine. However, the cost of fuel oil consumed by the paper industry alone (the state's largest industrial user of fuel) amounted to $11,507,000 in 1962, or 2.6% of the value of its total production that year. (Portland's prices per barrel in 1969 were somewhat higher than those in Boston - $2.21, New York - $2.33, Philadelphia - $2.32 and Baltimore - $2.21.)

The principal beneficiaries of reduced fuel prices in Maine would be users of No. 2 light fuel oil and gasoline. A 10% decrease in average refinery (wholesale) prices of No. 2 oil would have saved the State's homeowners more than $3.5 million in 1968. (Total consumption that year was 7,354,000 barrels at a wholesale price of $34,932,000.) Likewise, a 10% decrease in the retail price (excluding taxes) of gasoline would have saved the state's automobile owners $11 million in 1969. (A total of 450 million gallons at a total retail price--before taxes--of $110.9 million was consumed in Maine that year.)

**Electric Power.** Maine's electric power plants purchased 4,872,000 barrels of fuel oil in 1970 at a total cost of $9,136,000, or an average of $1,88 per barrel. A 10% reduction in fuel costs would have resulted in total savings of $941,000 or 4.4% of total production expenses for all types of power (steam, hydraulic, etc.). The effect of possible electric power rate decreases on the several classes of users will be discussed in a following section of this report.

It should be noted that petroleum refineries are substantial consumers of electric power. The 100,000-barrel per day refinery proposed for the Maine Coast would use about 210 million kilowatt-hours per year, while the 300,000-barrel plant would consume 630 million kwh.

4. Intangible Benefits

**Age Distribution.** The median age of residents of Maine (28.6 years) is somewhat higher than the U.S. average (28.1) primarily due to outmigration of younger working-age persons who have lacked sufficient economic opportunity in this state. The Portland Economic Area has an even higher median age (29.7 years), as does the Machias Economic Area. The latter offers a very small variety of jobs for high school and college graduates, who must therefore seek work elsewhere. By creating a substantial addition of construction and operating jobs, as well as indirect employment, to the minuscule economy of the Machias area, a new refinery would almost certainly lower the median age of its residents.

**Amenities.** The presence of a refinery might also spur increases in vocational education, added courses at Washington State College of the University of Maine, and the establishment of various cultural amenities. The higher incomes generated certainly would have a beneficial effect on the material and cultural well-being of the area's residents, and would help overcome the pessimism engendered by a lack of opportunities for younger people.

**Other Intangibles.** Much of our discussion of the consequences of new industry proceeds from an implicit assumption that "other things remain equal." That is, we are looking at the impact of a new industry and more or less assuming that other things will go on as before. But there are at least three parameters for which the assumption is probably not valid. One source of pervasive change is the growth in demand for both oil and electric power, and the evident requirement that a considerable number of new refineries and generating plants will have to be built on the East Coast over the next thirty years. With regional electric power demand doubling every ten years and petroleum demand doubling every fifteen, it is clear that vast additions to capacity will be located somewhere--if not in Maine then perhaps on its borders. Environmental problems may retard this growth, of course, but it seems doubtful at this point that any retardation will be significant enough to alter the general picture. Maine itself will need much greater amounts of energy in the future, and the cost of that energy will depend in part on whether it is produced locally or some distance away. If the latter is true, the state is apt to find itself at an increasing disadvantage when it comes to holding its own in matters of employment and wages.

Another source of change is the very uncertain condition of a few of Maine's present industrial employers. Apparently it would not take much to push some marginal mills over the edge. If foreign competition and new environmental standards continue to press, as seems likely, the state may find it difficult to keep some of its older, high cost plants in operation. We do not know how imminent the problem is--much depends on what is happening in other states--and we are wary of agruments for "protection." But it is necessary that we recognize the possibility that new industries such as oil may be needed simply to maintain employment, let alone generate incremental benefits.

A third source of change is the influx of people (of all ages) escaping from the cities and looking for amenity. Many bring their own incomes with them. Most seem to be anti-industrial in outlook. If the trend continues, we can expect the **evaluation** and perhaps even the definition of benefits to change. Our discussion of benefits may therefore be vulnerable on grounds of relativity.

**B. Costs--Identification and Measurement**

The negative impacts of the construction of a new petroleum refinery would include possible damage to the air, water, and land environment. An erosion of living conditions and deleterious effects on municipal services and finance also could ensue from the intrusion of a large industrial enterprise into a particular community.

1. Environmental Damage

**Air Quality.** Refineries emit variable quantities of sulfides and aromatic hydrocarbons into the atmosphere. The degree of air pollution is dependent both on the product mix and the technological controls on refinery machinery. For example, the older refineries along the Kill van Kull in New York Harbor emit highly odoriferous pollutants which can be detected twenty miles downwind. On the other hand, newer refineries with extensive investment in control devices emit only minor levels of pollutants. In these newer plants, flaring is reduced, too.

The location of a refinery also is a prime environmental consideration. Operation of such a plant in South Portland could introduce further pollutants into a highly populated area already subject to considerable smog and stench from a large pulp mill and other industries and urban structures. Although a large degree of air pollution introduced into the Machias Area would affect a small population, Washington County's blueberry crop (valued at over $1 million in 1970) and tourism (estimated at $3 million) might be reduced considerably. Much more study is needed before definite conclusions on this matter can be reached.

**Water Quality.** The principal waterborne residuals generated by a petroleum refinery are heat, sulfides, biological oxygen depletion, phenol, and oils. In addition, there is the danger of spillage of crude oil or refined products between ship and shore installations. A refinery producing 100,000 barrels per day would require a daily water intake of about 860,000 gallons, while a 300,000-barrel plant would need 1,730,000 gallons. Approximately 80% of this water would be needed for cooling, and the remaining 20% (of potable quality) for electric power generation, boiler feed, processing, and sanitary services.

Most of this water intake would be heated and discharged into the nearest stream or tidewater. Although the relatively small discharge of heated effluent would have a minimal effect on the nearby marine environment, the possibility of spillage of crude petroleum or refined products into inshore waters could have a deleterious effect on Washington County's fisheries landings (valued at $4 million in 1970) and its canneries (with an annual product of $9 million).

At present, Machiasport's coastal waters are given the highest saltwater classification (SA) by the Environmental Improvement Commission. Under the classification no discharges of toxic effluents are allowed. Presumably, a refinery in South Portland would cause less relative damage to the inner portion of Casco Bay, which already has a classification of SC, where discharge of treated industrial wastes is permitted. However, the waters around Long Island, where the oil terminal is most likely to be located, are classified SB-1 and SB-2, where waters must be clean enough for swimming and fishing. Further knowledge of the proposed refinery, its product mix and pollution controls, is, of course, essential before any assessment of possible damage to other water-based industries could be made.

It should be noted that the danger of petroleum spillage is greatest between ship and shore; especially in the case of a tanker rolling while tied to offshore dolphins or other floating structures. The danger of spillage is much less at fixed piers. A 100,000-barrel per day refinery would require about 5.4 million tons of crude oil per year, and a 300,000-barrel refinery would need 16.3 million tons in contrast to the 23.0 million tons of crude oil which arrived at Portland in 1970 for transshipment by pipeline to Montreal.

**Land Quality.** Construction of any sizable industrial installation, such as a major refinery, would have a marked impact on the visual quality of surrounding land. The scars and noise resulting from massive earth-moving operations and the continuous parade of dumptrucks and other equipment would turn a previously peaceful countryside into a beehive of activity. There also would have to be extensive installation of water, sewer, and power lines, new roads and parking areas which would drastically alter the character of the landscape near the refinery. The construction of piers and storage tanks at tidewater would induce significant changes in the shoreline affecting fisheries and the use of pleasure craft.

After the completion of construction, the peripheral areas presumably would be cleaned up for the most part. Nevertheless, the presence of the refinery towers, stacks, storage tanks, and power lines would remain an eyesore to some extent. This could be particularly disadvantageous at the shoreline of Machias Bay, which is one of Maine's scenic attractions. On the other hand, the banks of Fore River in South Portland now have little aesthetic appeal.

2. Other Consequences

The construction and operation of a major refinery would have a measurable effect on the life-style of the residents of South Portland, which already is part of an urbanized area. A refinery located in the rural village of Machiasport, on the other hand, would induce many of the problems, as well as benefits, of urban living. The easy-going Downeast mode of life would certainly be altered, especially for those persons directly or indirectly dependent on the refinery. Real estate values would increase, leading to haphazard development of lovely rural areas if inadequate land use controls were employed. Wages in other industries and services would rise, which would benefit employed persons but might drive out marginal enterprises such as canneries.

Vehicular and railroad traffic would increase, as would air and water pollution. Augmentation of public services such as roads, utilities, and schools probably would lag due to the fiscal problems of adjoining towns which would not benefit from the vastly increased property tax base in Machiasport. Because it is unlikely that permanent housing would be erected in advance of refinery construction, vast numbers of mobile homes would be required. It is likely that adequate housing in the entire area would be in short supply for years. However, any accurate assessment of potential community needs would have to await detailed engineering and land planning studies of the areas affected by the refinery.

**C. Related Industries**

1. Off-Shore Oil Drilling and Production

At a recent seminar on the economic impact of off-shore oil sponsored by the University of Maine at Orono, Dr. Peter McLaughlin, Chairman of the Department of Economics at the University of New Brunswick, stated that there definitely is petroleum on the continental shelf off the Maine coast. However, the likelihood and timing of the recovery of oil or gas will be dependent on the relative cost of extracting it from the ocean bed and delivering it to refineries on shore, in comparison with costs at other land or water sources.

Exploration and production costs of off-shore oil are enormous, particularly in the stormy Atlantic Ocean. Production platforms now cost about $15 million apiece, and oil pipelines to the shore require several million dollars per mile. Gas lines cost four times as much to lay as oil lines because of the much larger diameter of the former.

In Professor McLaughlin's opinion, the economic impact of off-shore exploratory drilling on the Atlantic Provinces (or Maine) will be negligible, since all equipment and personnel will be brought in from elsewhere. However, the utilization of nearby shore bases by boats and helicopters serving the drilling rigs will provide some benefits to local ship repair and supply firms. During the construction phase, economic spill-over to the coast will increase as shore-based piers, pipelines, and possible refineries are built. Although most construction personnel and machinery required for use in the ocean will be "imported," it is possible that local shipyards may construct some drilling rigs, production platforms, and service boats. After the construction phase, the small number of operating personnel initially will be outsiders, who may eventually be replaced by local employees. In fact, Dr. McLaughlin believes that the greatest long-term economic advantage of off-shore drilling to the local economy will come from the establishment of shore-side training programs to provide competent construction and operating personnel.

2. Petro-Chemicals

According to the 1963 national input-output table, 11.4% of all intermediate outputs of petroleum refineries were sold to various chemical industries. Petroleum derivatives used by these industries include benzol, liquid petroleum gas, naphthalene, phenol, and styrene. The most significant purchases of petroleum products by these industries were for industrial inorganic and organic chemicals ($955.5 million), fertilizers ($4.9 million), other agricultural chemicals ($19.5 million), miscellaneous chemicals ($70.6 million), plastics materials and resins ($45.5 million), synthetic rubber ($61.9 million), cellulosic man-made fibers ($1.0 million), noncellulosic organic fibers ($2.2 million), drugs ($10.9 million) cleaning preparations ($42.9 million), toilet preparations ($2.7 million), paints and alied products ($102.4 million). Most of these industries also require tremendous quantities of electricity and water.

At the present time, half of the production of industrial chemicals is concentrated in the states of New Jersey, Texas, Ohio, West Virginia, Tennessee, and New York, all of which also contain sizable petroleum refineries. About half of national plastics production is located in Virginia, Tennessee, Pennsylvania, North and South Carolina, and Texas, most of which have oil refineries or are situated fairly close to them. Production of drugs, soap, cleaners and toilet goods, and paints is concentrated mainly in the Middle Atlantic and East North Central states, which contain about 35% of the nation's petroleum refinery capacity. Most of the above industries utilize large-scale plants to produce for national or regional markets. According to Peter McLaughlin, who was quoted previously, the Gulf Coast has a great advantage in retaining these industries because of its present surplus capacity and nearness to major oil refineries. Generally, the production of feedstocks by one refinery alone is not sufficient to supply the needs of a large chemical plant.

Petro-chemical plants tend to grow in clusters, because the output of one often is needed as an input to others. It is a highly-automated industry in which a $100-million plant might employ only about 100 well-paid people. (The U.S. average in 1970 was $8,813.) The economic impact of such an establishment would be similar to that of an oil refinery, with a significant proportion of "imported" construction materials and labor and a substantial though diminishing share of outside personnel needed to operate the plant. At the present time, neither the oil refinery at Port Hawkesbury, Nova Scotia, nor the plant near St. John, New Brunswick, has induced the construction of nearby petro-chemical industries. The prospects for such plants in Maine require considerably more research.

## IV. ELECTRIC POWER GENERATION AND CONSUMPTION

### A. Maine Yankee Plant

The new generating facility of the Maine Yankee Atomic Power Company, 50 per cent of which is owned by the three largest electric utilities in Maine (Central Maine Power Company, Bangor Hydro-Electric Company, and Maine Public Service Company) is located on Montsweag Bay in Wiscasset. It has been under construction since 1968, and is planned to become operational later in 1972. Its 855,000 kilowatts will almost double the current name-plate capacity of 929,000 kw of all utility power plants throughout the state.

1. Benefits – Identification and Measurement

Employment by the contractors, sub-contractors, and utilities themselves at the construction site has neared 1,200 at peak periods, and has averaged about 640 per day during the 4-year construction period, or over 10% of the 6,000-person labor force of the Wiscasset area. It is believed that perhaps 90% of these construction workers were Maine residents prior to their employment at this site.

Of the total capital investment of about $200 million, it is estimated that payrolls and other payments to contractors and vendors within the state amounted to a total of $56 million during the construction period of which about $23 million was for payrolls alone. These payrolls, which averaged $5 million per year, represented a significant fraction of the $46.4 million total personal income of the Wiscasset area in 1969. The operating staff will consist of 80 permanent employees with total wages of about $700,000.

The impact of this single large plant on the tax base of Wiscasset is, of course, tremendous. The assessed valuation of all taxable property is likely to rise from $15,986,000 in 1968 (of which two-thirds was attributable to the power company) to well over $100 million in 1972. During the same period, town tax collections will increase from $623,000 to $2,244,000.

It is estimated that the Maine Yankee plant will generate power at an average total cost of 6 to 7 mills per kilowatt hour over the first 15 years of operation. While this figure is not significantly lower than the average of existing Maine plants (and thus promises no reduction in power rates when the Yankee plant becomes operational), it is considerably lower than alternative new sources of electric energy. Beyond matters of cost, moreover, the plant will provide a dependable source of base-load power sufficient to satisfy the state's needs for many years.

2. Costs – Identification and Measurement

The Maine Yankee plant will not utilize fuel oil, so that the unsightliness of petroleum terminal operations and the danger of oil spills between tankers and shore installations will be obviated. However, there appears to be an unknown potential danger of a reactor "melt-down" in case of failure of the emergency cooling system, as well as the continuous effects of low-level radiation during ordinary operation. In addition, some persons feel that that huge volume (613 mgd) of effluent heated $25^{o}$ above the temperature of the cooling water source will have a deleterious effect on bloodworms and other species of marine life, while others believe that oysters or other species may be cultivated profitably in the heated waters of Montsweag Bay. All the above questions are in hot dispute, and answers have thus not been determined. Since the Atomic Energy Commission will hold hearings on these subjects within the coming months, we will not attempt at this point to prejudge the conclusions.

**B. Additional Power Plants**

In view of the rapidly increasing demands for energy in New England and the limited availability of cold water for condensing purposes, it is likely that a number of additional large-scale generating plants will be constructed along the Maine coast during the next twenty years. The report by Zinder and Associates to the New England Regional Commission projects a 20-year rise of 252% in peak demand in Maine and a 344% rise in New England as a whole. It also projects two new coastal plants in Maine with a capacity of 2,400 Mw by 1990. These requirements may be met in part by importation of power from New Brunswick and Quebec, by addition of more generators at Cousins Island and Maine Yankee, by possible hydro-electric developments at Dickey-Lincoln or Passamaquoddy, or by construction of additional steam plants (nuclear or oil-fired) along the coast. An appendix to the Zinder Report (by Industrial Bio-Test Laboratories, Inc.) favors the areas near Vinalhaven, Richmond Island (Cape Elizabeth), and to the south for sites of additional power plants.

The North Atlantic Regional Water Resources Study of the Corps of Engineers goes well beyond Zinder in anticipating that 20 to 30 power sites will be required along the Maine coast by the year 2020, on the assumption that these plants will be needed primarily to "export" power to the lower New England states which have fewer potential sites available. Since the NAR report has not yet been published in final form, we cannot evaluate the reasonableness of its conclusions at this time.

**C. Consumption of Electric Power**

1. Heavy Industrial Users

Among the industries consuming the most electricity, as measured by kilowatt hours per production worker throughout the nation in 1967, are the following: primary nonferrous metals (1,112,000 kwh per worker), industrial chemicals (487,000) hydraulic cement (286,000), petroleum refining (231,000), pulpmills (152,000), building paper and board mills (136,000), and other papermills (114,000). All the above industries also consume tremendous quantities of water for processing, boiler feed, and cooling.

Electric power was purchased by these industries generally at less than the national average rates (8.69 mills per kilowatt hour in 1967): primary nonferrous metals (3.65), industrial chemicals (5.48), hydraulic cement (8.79), petroleum refining (7.03), pulpmills (5.38), building paper and board mills (8.33), and other papermills (7.23). During 1962 (the latest year for which Maine figures are available) the state's manufacturers paid an average of 11.22 mills per kilowatt hour, although the largest consumer--the pulp and paper industry--paid only 8.36 mills, which was close to the national average for that industry (8.16 mills).

On the basis of relative power rates alone, it would appear that primary nonferrous metals (principally aluminum) and industrial chemicals would be precluded from establishing plants in Maine. On the other hand, pulp, paper, and cement mills, which already are located in this state, might expand if future demand warrants. A petroleum refinery may also be constructed here, as was discussed previously in this report. (The prospects of the paper industry in Maine will be analyzed in greater detail in a following section of this report.)

2. Effect of Electric Rates on Consumption

If a possible 10% decrease in the price of fuel oil in Maine, due to the construction of a new refinery in this state or for other reasons, could have been translated into a reduction of 3% in typical industrial electric bills in Maine, the resulting bill for large power users (200,000 kilowatt hours) in the first quarter of 1972 would have been $3,435 (instead of the actual average of $3,541). These figures are considerably below comparable charges in all other New England states. On the other hand, moderate industrial users (60,000 kwh) of power now pay slightly higher average monthly bills in Maine ($1,346) than in New Hampshire, but much less than in the other New England states. A 3% reduction in these charges in Maine would have resulted in an average bill of $1,306--lower than those in all other New England states. Small industrial users (30,000 kwh) of power also are at an advantage in Maine (where the average bill is $657), in contrast with users elsewhere in New England. A 3% reduction in Maine's power charges would have added to this advantage. As was stated previously, Maine's industrial power rates are not low enough by themselves at attract major consumers of electricity unless there are other powerful locational advantages such as raw materials (e.g., paper) or a coastal location on deep water (e.g., petroleum refinery). On the other hand, industries consuming moderate amounts of electricity are not precluded from building plants in Maine solely by the presence of somewhat higher power rates in a few categories. (Total costs for electricity purchased by all U.S. industries in 1967 amounted to only 0.7% of the value of shipments or 1.4% of the value added by manufacture.)

Maine's commercial users of electric power now pay lower charges than consumers in any other New England state, with the exception of the smallest users (375 kwh) in Connecticut, Rhode Island, and Vermont. Typical monthly bills for 750 kwh, 1,500 kwh, 6,000 kwh, and 10,000 kwh in Maine during the first quarter of 1972 were substantially below comparable charges in Vermont, New Hampshire, Massachusetts, Rhode Island, and Connecticut. A 3% decline in Maine's charges would have had little effect on this state's rank.

**Residential** users of electricity in Maine at the moment pay less than those in other New England states, except for small-usage consumers in Massachusetts. A 3% reduction in Maine's residential bills would not change this state's ranking in respect to the remainder of New England. Rate increases now proposed by the state's two largest utilities, if adopted as a whole or in part by the Public Utility Commission, will alter Maine's comparative position.

## V. PULP AND PAPER PRODUCTION

The paper industry in Maine and elsewhere currently is experiencing problems related to oversupply, as well as the costs of introducing expensive pollution-control devices. However, the long-term demand for paper products certainly will rise, and consequently there will be a need for more manufacturing facilities to serve this expanding demand and to replace the obsolete plants forced to close for environmental reasons. Although Maine is at some disadvantage in comparison with the southern states, where the tree growth cycle is faster because of the warmer climate, it appears likely that total national demand for paper will be sufficient to justify the construction of at least one large integrated pulp and paper mill in this state within the next twenty years.

### A. Benefits--Identification and Cost

We will postulate the construction of a $120-$130-million plant capable of producing 250,000 tons of groundwood specialities (paper and market pulp) per year. It would have to be located close to a substantial and continuing supplv of pulpwood (700,000 cords per year) and have easy access to tremendous supplies of fuel oil, electricity, water, or steam. Because of these huge energy needs, the mill would be situated ideally adjacent to a large power plant or oil refinery on tidewater. The proposed refinery site at Machiasport might prove satisfactory because of its location near extensive woodlands as well as the refinery and a possible power plant. An urban site such as South Portland would be less satisfactory for many reasons.

A peak of 1,000-1,200 construction workers would be needed during a period of about 2½ years to build a mill of this size. Over three-fourths might be present Maine residents, and the remainder would come from other states. These workers would boost the current labor force of the Machias area by 40-50%, and their wages spent in the area would increase its total personal income about 61-73%. After construction, operating personnel would number approximately 600 (plus 400-500 loggers in the woods), which would increase the area's labor force by 25% and its personal income by $5 million, or 30%. (Over 80% of the plant's operating labor force is likely to consist of present state residents, but not necessarily from the Machias area.) Additional indirect effects computed through use of multipliers would be similar to those of the refinery described previously. The property tax impact also would be comparable to that of a refinery with the same assessed valuation.

**B. Costs — Identification and Measurement**

The air and water pollutants produced by pulp and paper mills are well known, expecially to residents of municipalities such as Westbrook and Rumford who experience them continuously. However, a substantial share of the obnoxious sulfur compounds and other pollutants can be captured and often reused in the most modern installations.

As was mentioned above, pulp and paper mills require tremendous amounts of energy and water. In 1962, Maine's paper industry purchased 4.4 million barrels of fuel oil at a total cost of $11.5 million and 820 million kilowatt-hours of electricity costing $6.9 million (plus an additional amount generated by the paper companies themselves). The receipt of such quantities of fuel oil increases the possibility of oil spills, and the generation of power induces a certain amount of air pollution, depending on the type of fuel employed. A mill of the size postulated would require about 314,000 barrels of oil for steam generation and 45-50 megawatt-hours of electricity per year.

Maine's paper industry received 154 billion gallons of fresh water in 1967, or about 10.8 million gallons per worker. Most of this supply (101 billion gallons) was used in processing paper, with the remainder employed in electric power generation and boiler feed. 94% of the water intake was discharged into adjacent streams or tidewater. A paper mill of the postulated size would receive about 30 million gallons per day or 11 billion gallons per year. Water intake of this magnitude presents problems of supply, and the heated effluent with some pollutants also may result in environmental degradation to some degree. These undesirable effects should be minimized or isolated as much as possible.

## VI. OTHER INDUSTRIES

As was mentioned previously, the only other "heavy" industries now located on the Maine coast are hydraulic cement production and shipbuilding. The recent expansion of the cement plant appears to be ample to serve Maine's needs for many years. With the expansion of the Bath Iron Works now underway, the state's two shipyards (at Bath and Kittery) also appear adequate for the foreseeable future, which is largely subject to the vagaries of federal maritime and defense policy. In any event, if expansion becomes warranted, it presumably will take place at the existing yards rather than at entirely new ones.

Among the heavy industries which are not located on the Maine coast at present, industrial chemicals (except possibly for certain petrochemicals), plastics, flat glass, blast furnaces, foundries, and motor vehicles are unlikely to be established here either because of raw materials inadequacies or distance from primary markets.

"Light" industries requiring lesser quantities of materials or energy which might expand on the Maine coast include lumber and wood products, furniture, boatbuilding, and many others which might be worthy of further investigation, but which are not properly the subject of this paper.

## VII. POLICY ALTERNATIVES AND COMBINATIONS

Preceding sections have considered the consequences of certain types of industrial activity on the Maine coast. If the state decides, after weighing these consequences, to undertake or promote such activity, the question remains how to control development so as to assure that benefits are maximized and costs minimized. This section explores some of the policy alternatives. Policies are assumed to govern situations in which the types of industrial activity already discussed are being developed. Specifically, we inquire into policies appropriate to the construction and operation of oil refineries, oil terminal operations, petro-chemical facilities, large-scale electric generating stations, pulp and paper mills, and possibly dry-bulk cargo transshipment facilities.

### A. Zoning Imperatives

Perhaps the most obvious and necessary policy is industrial zoning. Only zoning can prevent industrial sprawl and the resulting tendency to maximize costs and minimize benefits rather than the other way around. Zoning should recognize that the predominant uses of the coast will continue to be recreational and aesthetic, interspersed with small-scale, individualistic activities such as fishing, clamming, and boat construction, repair and servicing. It should also recognize the legitimacy and nonpolluting character of such intermediate-level industries as aquaculture and shipbuilding; indeed, it should encourage further expansion of such activities in locations where there is no significant conflict between adjacent land-water uses.

But the important matter, of course, is the zoning of coastal lands for heavy industry. In view of our above discussion of the "costs" of oil, for example, it would seem essential that such development be limited to one or two locations on the coast. Moreover, it would be desirable--on all grounds save national defense--to concentrate several types of industry at these few points. Thus, it might be possible to combine a refinery, tank farm, pulp mill, and generating station in the same industrial "park", recognizing mutual benefits (e.g., use of outputs from one facility as inputs for another) and thereby minimizing "sprawl".

Zoning of the sort under discussion presupposes a comprehensive coastal plan. Since the State Planning Office is embarked on this project, it would seem premature for the Task Force to come to any hard and fast conclusion concerning zoning--other than the sort of endorsement suggested above. It is clear, moreover, that compulsory zoning of coastal lands has already been set in motion by the Legislature. (Only about 33 of the 139 coastal towns, however, have their own zoning ordinances as yet.) And it is probably not premature to suggest the following points:

1. Such zoning (i.e., zoning for heavy industry) should be the prerogative of the **State.** Otherwise there may be competition developing among the towns, each seeking to expand its employment and tax base, thereby defeating the principle of zoning. The **quid pro quo** here is the necessity of State rather than purely local taxation.

2. Industrial zoning should both allow for and encourage inland locations with corridors to the sea, thereby reducing the adverse environmental impact of coastal plants, albeit at a somewhat higher cost to the firms involved.
3. If environmental licensing procedures and criteria now applicable throughout the state are to be used within an industrial zone, then it would be advisable to raise the criterion of economic benefit to a comparable level. Otherwise there is a real possibility that **nothing will get built.** A logical answer here would be to retain present environmental controls for all extra-zone effects: intra-zone impact should then be controlled by the zoning regulation itself. Presumably, if a zone for heavy industry is defined at all, the definers are saying the probable adverse impact on the local environment is tolerable. But it might be well to require a showing that adverse impact will not extend beyond the zone in question. The industrial area then can be viewed as a "mixing zone," with existing environmental standards fully applicable beyond the zone boundaries.
4. Zoning regulations should specify performance bonds to assure compliance with whatever standards are laid down. Projects should not be allowed to commence construction unless there are guarantees of completion to acceptable standards.

**B. Finance, Taxation, and Subsidies**

Coastal planning and zoning constitute a permissive approach to the achievement of public objectives. In themselves they neither presuppose nor preclude public enterprise or finance as additional means of encouraging selective development, It would seem, however, that a more active role for the government might well be limited to encouraging other than heavy industries of the sort considered in this paper. As far as we can see, neither the oil, paper, power, nor chemical industries require public incentives (beyond zoning) to locate in Maine. Unless the State had reason to believe it needed and could acquire the outputs of these industries at substantially lower prices as a result of direct public intervention, therefore, it would seem advisable to steer clear of public ownership and subsidies (including financial guarantees for bonds).

On the other hand, the fact that Maine does have something valuable to offer such industries (deep harbors, cold water, etc.) means the State ought to be able to command a good price for permitting their location here. In other words, while special incentives may be necessary to attract more "desirable" types of industry, the State in the case of heavy industry should be able to levy substantial taxes. These in turn would make a major contribution to the underwriting of public services and to improving Maine's own balance of payments. Indeed, taxing oil refineries probably makes at least as much sense as taxing summer visitors.

One way of assuring at least the average tax take from heavy industry is to insist on State-level taxation. We do not have many present examples of this technique, although there has been a State tax (applied at a low level) against the railroads in lieu of local property taxes on their rights of way. This approach would prevent a large industry from driving down the tax rate in a small town. When the latter happens, it simply means the State is subsidizing the buyers of the firm's products--whether those buyers be in Maine or elsewhere. If there are constitutional barriers to State-level taxation of this sort, then it may be necessary for the State to exact payment in some other fashion. The important thing is to **avoid subsidy**, unless it can be shown that subsidies would materially lower the price of, for example, fuel and power to Maine consumers. And even then it is questionable whether subsidies should be granted if the industries in question really need Maine locations.

**C. The Industrial Port Authority Concept**

If Maine chooses to open up one or two areas on its coast to new heavy industry, the port authority concept has much to recommend it. Such a concept is probably out of place where light industry is concerned. . . . or at least it would seem to be unnecessary in that instance. But, if we are correct in believing that State zoning--following on a comprehensive plan for the coast--is the only way to preserve what we have while still allowing the establishment of some new industries which we know to be interested in Maine, then State initiative in defining and setting aside one or two zones for the purpose is clearly desirable. In this way the public as a whole can, through the Legislature, decide where to locate heavy industry and where the latter will be prohibited.

It is also true, however, that the concept can be easily distorted to meet the aims of industrialists or environmentalists or both. The latter seems to have characterized the bill which was recently before the Legislature. Environmentalists (some of them) were pacified by the exclusion of oil beyond the limits of the zone and by the stipulation that E.I.C. standards not only remain in effect but take precedence over economic benefits. Industrial interests, on the other hand, were met at least in part by limiting Authority revenues, hence rents and charges, to those which would cover operating and financial costs of the Authority. Since the Authority would issue tax exempt bonds for the purpose of acquiring land to be leased to industry, would be able to acquire properties by eminent domain (except for the power companies' property!), and would make payments in lieu of taxes to towns based only on costs of service, the industries in question are in effect given a subsidy. And the failure to assure that at least part of the taxes paid by the industries on their plant and equipment would accrue to the State, and would be paid at a State-determined rate, meant that local tax rates could be driven down in much the way they can be at present. So the bill, by attempting to please everyone, ended by pleasing only a few.

Looking over the experience of the past several months, we think perhaps the most important objectives of the industrial port authority approach should be (1) to make explicit the exclusionary principle--i.e., no heavy industry outside of the zone; (2) to make certain that benefits and costs are evenly weighed, which means essentially a fair examination of the trade-off between economic benefits and environmental costs; (3) to assure a taxation or leasing technique which would yield substantial revenues to the State as well as to the local areas involved: and (4) to make certain that air, land, and water quality standards are set high enough to compel use of the best known technologies in production and emission control.

## APPENDIX

## IMPACT OF SELECTED HEAVY INDUSTRIES ON MAINE COAST

| Item | Unit | Petroleum (100,000 bbl.) | Refinery (300,000 bbl.) | Elec. Power Plant (800 MW nuclear) | (800 MW fossil) | Pulp & Paper Mill |
|---|---|---|---|---|---|---|
| Construction cost | ($ mil) | 175-240 | 325-475 | 200 | 140 | 120-130 |
| Construction employment* | (persons) | 700 | 1,400 | 640 | 300 | 1,000 |
| In state | | 510 | 700 | 576 | 270 | 750 |
| Out-of-state | | 260 | 700 | 64 | 30 | 250 |
| Construction payrolls** | ($ mil) | 9 | 11 | 23 | 9 | 8 |
| In state | | 6 | 6 | 20 | 8 | 6 |
| Out-of-state | | 3 | 5 | 3 | 1 | 2 |
| Operating workforce | (persons) | 124 | 175 | 80 | 60 | 600 |
| In state | | 83 | 88 | 80 | 60 | 500 |
| Out-of-state | | 41 | 87 | — | — | 100 |
| Operating payrolls | ($ mil) | 1.6 | 2.2 | 0.7 | 0.5 | 5.0 |
| In state | | 1.1 | 1.1 | 0.7 | 0.5 | 4.0 |
| Out-of-state | | 0.5 | 1.1 | — | — | 1.0 |
| Direct & indirect employment | | | | | | |
| Urban multiplier-1.8 | (persons) | 223 | 315 | — | — | — |
| Rural multiplier-1.3 | (persons) | 161 | 228 | 104 | 88 | 780 |
| Water intake | (mgd) | 0.9 | 1.7 | 613 | 360 | 30 |
| Water discharge | (mgd) | 0.9 | 1.7 | | | 28 |

* Annual averages; **Totals

Sources: Stone & Webster Engineering Corp. (petroleum refineries); Central Maine Power Co. (electric power plants); Great Northern Paper Co. (pulp & paper mill); Partly estimated by PARC.

APPENDIX II

# A Non-Industrial Future for the Maine Coast

## An Allagash Group Report to the Governor's Task Force on Energy

by
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with the assistance of:

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## A Statement of Purpose

The objective of this paper is to project and discuss the consequences of a state policy to exclude heavy industry from the Maine coast. In the absence of heavy industry, the following six activities will continue to dominate the coastal economy:

1. Tourism and recreation
2. Second-home development
3. Fishing and aquaculture
4. Research and educational institutions
5. Retail and consumer service firms
6. Existing light industry, agriculture and goods production

The paper outlines four basic concepts:

1. Even without heavy industry, between 1972 and 1992 the Maine Coast will face serious social and environmental consequences from rapid growth in the number of tourists.

2. Current state policies will generate a proliferation of small retail and consumer service firms along the Coast. Such firms are relatively undesirable as a major form of economic growth because:

a. they are poor generators of further growth;
b. they have poor multiplier effects compared with other industries;
c. after 1982, much of this sector will be dominated by national firms and franchises.

3. Preservation of the desirable social and environmental qualities of the Maine coast requires state policies to channel future visitor-serving industries inland by:

a. transportation planning to make inland areas more accessible;
b. major resort developments of sufficient mass to attract visitors away from the coast;
c. taxation and land-use policies limiting peak load populations in coastal areas to levels consistent with desired social and environmental characteristics.

4. There is nothing inherently incompatible between heavy industries and activities requiring high quality coastal resources if heavy industry is concentrated in a maximum of two coastal enclaves and is strictly regulated.

**Future Trends on the Maine Coast**

FOCUS: In the absence of heavy industry, the major source of economic growth on the Maine Coast will be increased flows of people seeking recreational space and second homes. The following section develops and explains a scenario for this growth.

BASE DATA: There are, presently, two major studies of the Coast. One set of measures and estimates was prepared by Carl Veazie of the Public Affairs Research Center (PARC) of Bowdoin College. Much of this work appears as the Recreation section of the recent study, **Maine Coastal Resources Renewal (MCRR)**, prepared by the State Planning Office. The other major study, **Tourism in Maine** was prepared by Hossein Askari of Tufts University for The Allagash Group during the summer of 1971. There is some difference in their two sets of figures. However, with certain exceptions noted below, we did not feel the differences were significant in terms of our conclusions. We have, for the most part, used the PARC figures.

PARC's estimates of millions of visitor days for selected lodging categories is reproduced in panel A of Table 1. Panel B of this table shows the estimates of visitor days we will use as the basis for our calculations. Inspection will reveal that the two sets of figures differ only in the 1980 and 1990 estimates for summer residences. We feel a much greater rate of increase in the number of visitor days is justified by the increased amount of new construction in this area.

TABLE 1

A) Veazie Estimates

| type of lodging | millions of visitor days | | | millions of tourism dollars | | |
|---|---|---|---|---|---|---|
| | 1970 | 1980 | 1990 | 1970 | 1980 | 1990 |
| summer residence | 6.0 | 9.0 | 12.0 | 44 | 60 | 80 |
| hotel and motel | 2.4 | 5.6 | 8.5 | 48 | 112 | 170 |
| public campgrounds | 0.3 | 0.7 | 1.0 | 2 | 4 | 5 |
| private campgrounds | 2.1 | 4.9 | 7.4 | 10 | 25 | 37 |
| total | 10.8 | 20.2 | 28.9 | 104 | 200 | 292 |

B) Allagash Estimates

| type of lodging | millions of visitor days | | |
|---|---|---|---|
| | 1970 | 1980 | 1990 |
| summer residence | 6.0 | 11.0 | 16.9 |
| hotel and motel | 2.4 | 5.6 | 8.5 |
| public campgrounds | 0.3 | 0.7 | 1.0 |
| private campgrounds | 2.1 | 4.9 | 7.4 |
| total | 10.8 | 22.2 | 33.8 |

Note: Does not include day visitors

Today, unlike ten years ago, mortgage money is available for land development. The rapid increase in Maine land values has increased the security of the lender and assured him he would have little trouble disposing of a foreclosed property at a favorable price. The recent boom in recreational land development in the Northern New England States has also served to create a larger store of expertise among land developers which should allow them to undertake larger more sophisticated developments in the future. Finally, the undeveloped areas to the east of Penobscot Bay appear to be held in larger parcels than the lands to the southwest. This should facilitate larger developments with shorter lead times for site assembly. Thus overall, we feel second home construction should increase rapidly to 1980 and continue to increase as people who purchased land in the 1970's begin construction and as vacant land on large parcels is sold off.

The increase in visitor days is not solely a function of the number of summer homes. It also relies on the number of occupants of a summer home and the average length of stay for those occupants. Here the factors move in opposite directions. In 1970, the number of occupants per summer residence was assumed to be 4.4. This included not only the family owning the residence, but also day and overnight visitors. We assume that this average number of occupants will fall over time as family size decreases and as rising real income allows families to purchase summer homes earlier in the family life cycle before they have all their children. Thus we feel that in 1980 the average occupants per dwelling will fall to 4.0 and in 1990 will have fallen to 3.5.

This decrease in average occupants will be offset by an increase in the average number of days each occupant spends at the summer residence. The average number of days should increase as the four and three day work week becomes more common and summer vacations become longer. There is also currently an observable trend of converting what were summer structures to dwellings suitable for occupancy year-round. This trend means people are beginning to spend periods such as Christmas and Thanksgiving in Maine. Of course, dwellings located near coastal ski areas may occasionally be used for this purpose. Based on these trends, we feel average number of days of occupancy will rise from 45.5 in 1970 to 60 days in 1980 and 70 days in 1990.

The overall result of these trends is to increase the average visitor days per seasonal residence from 200 in 1970 to 240 in 1980 and 245 in 1990.

The final factor in the computation is the number of homes used as vacation residences. Veazie gives the number of Maine summer homes at present as 23,000. This is based on the 1966 **New England Vacation Home Survey** prepared by the Department of the Interior, Bureau of Outdoor Recreation. We feel, however, that this count underestimates the number of homes used as recreation homes by omitting year-round residences which have been purchased by out of staters for this purpose. We thus use 30,000 as the number of homes used for recreational purposes.

We anticipate the number of homes used for recreational purposes on the Coast will rise to 46,000 by 1980. Such an increase requires new construction or conversion of only 1,600 homes per year. Most of this activity would be concentrated at the end of this decade. Given the present rate of real estate activity, this seems a reasonable projection of recreational home development. In the 1980's new construction should predominate. Many people buying Maine land in the 1970's will not be able to build immediately. This should push new construction well into the 1980's even though land sales may slacken in this period. Conversion of existing dwellings should decrease as suitable older buildings will be scarcer in what are presently sparsely populated areas of the eastern coast. We anticipate the number of dwellings for recreational use on the Coast will increase to 69,000 by 1990, averaging 2,300 starts or conversions per year.

EXPENDITURES PER VISITOR DAY (EVD): We had substantial disagreement with PARC's estimates of future expenditure patterns. Figures for EVD are derived by dividing the total anticipated expenditure for a lodging-year category in panel A of Table 1 by the corresponding figure for number of visitor days. Veazie's estimates of EVD are shown in Panel A of Table 2. While it is not clear whether these figures are constant or current dollars, we feel they are misleading in either case. All categories show decreasing EVD over time. Given a strong demand for Maine recreation and rising real incomes, we feel it much more likely that real expenditure (1980 and 1990 figures in 1970 dollars) will increase.

TABLE 2

A) Veazie estimates

| type of lodging | expenditure per visitor day | | |
|---|---|---|---|
| | 1970 | 1980 | 1990 |
| summer residents | 7.33 | 6.67 | 6.67 |
| hotel and motel | 20.00 | 20.00 | 20.00 |
| public campgrounds | 6.67 | 5.71 | 5.00 |
| private campgrounds | 4.76 | 5.10 | 5.00 |

B) Allagash group estimates

| type of lodging | expenditure per visitor day | | |
|---|---|---|---|
| | 1970 | 1980 | 1990 |
| summer resident | 7.33 | 9.50 | 12.00 |
| hotel and motel | 20.00 | 30.00 | 35.00 |
| public campground | 3.84 | 5.50 | 7.50 |
| private campground | 4.50 | 6.50 | 8.50 |
| day visitor | 1.10 | 1.75 | 2.50 |

We also disagree with several facets of the camper estimates. Askari's work indicates Camper EVD without campground charges to be approximately $3.10. We feel his figure is better substantiated than Veazie's. In addition, Veazie shows EVD for those staying at public campgrounds as higher than those at private campgrounds. We find this unlikely since private firms are likely to cater more to the high income market while state campgrounds will have to limit their charges to levels acceptable to Maine residents. Thus we feel EVD for campers staying at private campgrounds will always exceed EVD for campers at state parks.

DAY VISITORS: In the imprecise world of tourism estimates, there is perhaps no area quite as uncertain as estimates of the volume and economic impact of Day Visitors, those people who do not stay in Maine overnight. In fact, neither Veazie nor Askari provide estimates on these visitors. A rough estimate can be had by taking Day Visitors to be a remainder of tourists unaccounted for by other categories.

TOTAL VISITORS: Based on data from the highway Commission and the Department of Economic Development, Askari has estimated 3.0 million as the number of individuals who came to the Maine Coast during Summer, 1970.

VISITOR DAYS PER VISITOR: Table 3 shows our estimate of the duration of stay for the four categories of seasonal visitors which have been studies. These coefficients yield estimates of the number of visitors as shown in Table 3. When this estimate is subtracted from the estimate of total visitors, the remainder can be thought of as a rough estimate of day visitors.

TABLE 3

A) Number of coastal day visitors

| type of lodging | 1970 visitor days | days per visitor | number visitors |
|---|---|---|---|
| summer residents | 6,000,000 | 45.5 | 132,000 |
| hotel and motel | 2,400,000 | 4.5 | 533,000 |
| public campgrounds | 300,000 | 3.0 | 100,000 |
| private campgrounds | 2,100,000 | 3.0 | 700,000 |
| total | 10,800,000 | | 1,465,000 |

| | |
|---|---|
| Total, coastal summer visitors | 3,000,000 |
| Overnight visitors | 1,465,000 |
| Day visitors | 1,535,000 |

B) Day visitor projections

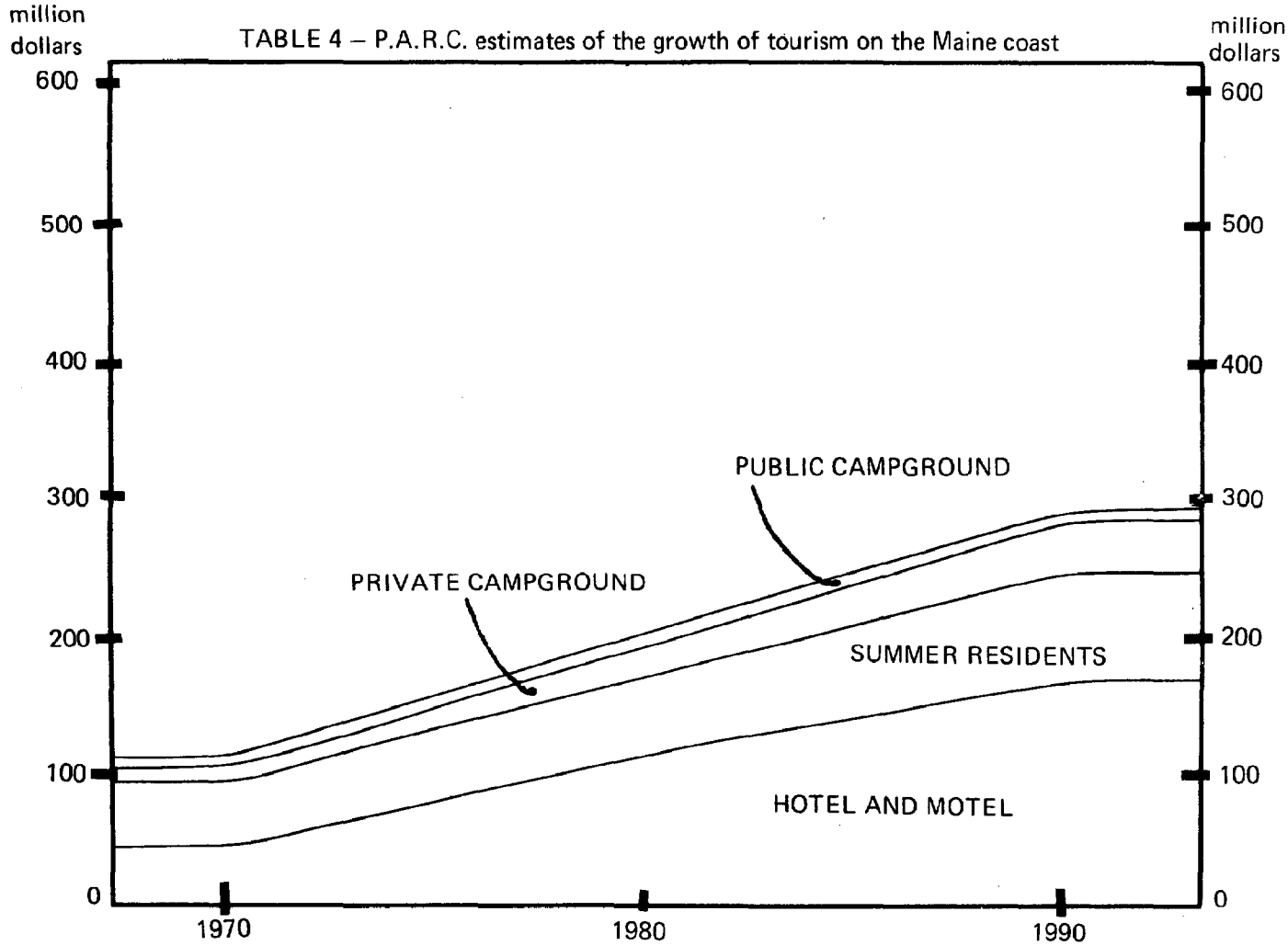
| Year | Growth/Year | Visitor days | EVD |
|---|---|---|---|
| 1970 | | 1.5 | $1.10 |
| 1980 | 1.5% | 1.8 | $1.75 |
| 1990 | 0% | 1.8 | $2.50 |

EXPENDITURE PER VISITOR-DAY: Little or no data exists to support an estimate of EVD for Maine's Day Visitors. However, the contribution can be assumed to be small. One hint of this was supplied by the Highway Commission. A study done several years ago on the gasoline tax showed peaking of collections was only about half the peaking at the Kittery Bridge. This suggests that many visitors are coming from a sufficiently short distance to arrive, conduct their visit and depart without refueling. Normal cars having this trip pattern would have to be coming from a nearby state and concentrating their activities in the Southwest part of the state. Such a scenario is consistent with the heavy use of sand beaches in York and Cumberland counties. These visitors' expenditures would, in all probability, be limited to highway tolls and an inexpensive meal. We tentatively estimate their 1970 EVD at $1.10. We estimate 1980 EVD at $1.75 and 1990 at $2.50.

GROWTH PATTERN: Visitor Days for this category of tourist should grow in proportion to the population of the adjacent metropolitan areas of Boston and Manchester. We estimate this to be roughly 1.5. Because of the limited area of the Coast accessible in 1.5 - 2.0 hours driving time from the urban areas, we feel this growth will stabilize around 1980 with additional demand being pushed to inland waters or into other categories of tourism having larger access zones. Panel B of Table 3 shows estimates of visitor days for day visitors in 1980 and 1990.

TOTAL TOURIST EXPENDITURE: In a sense, the bottom line of all these calculations is the contribution of tourism in all its forms to the Maine economy. As we stated before, total expenditure is the product of Visitor Days and Expenditure per Visitor Day.

TABLE 4 – P.A.R.C. estimates of the growth of tourism on the Maine coast




| type of lodging | millions of visitor days | | | millions of tourism dollars | | |
|---|---|---|---|---|---|---|
| | 1970 | 1980 | 1990 | 1970 | 1980 | 1990 |
| summer residents | 6.0 | 9.0 | 12.0 | 44 | 60 | 80 |
| hotel and motel | 2.4 | 5.6 | 8.5 | 48 | 112 | 170 |
| public campgrounds | 0.3 | 0.7 | 1.0 | 2 | 4 | 5 |
| private campgrounds | 2.1 | 4.9 | 7.4 | 10 | 25 | 37 |
| total | 10.8 | 20.2 | 28.9 | 104 | 200 | 292 |

APPENDIX I

**A Report to**
**The Governor's Task Force on Energy,**
**Heavy Industry, and the Maine Coast**

# HEAVY INDUSTRY ON THE MAINE COAST

by
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PUBLIC AFFAIRS RESEARCH CENTER
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Bowdoin College
Brunswick, Maine

May 1972

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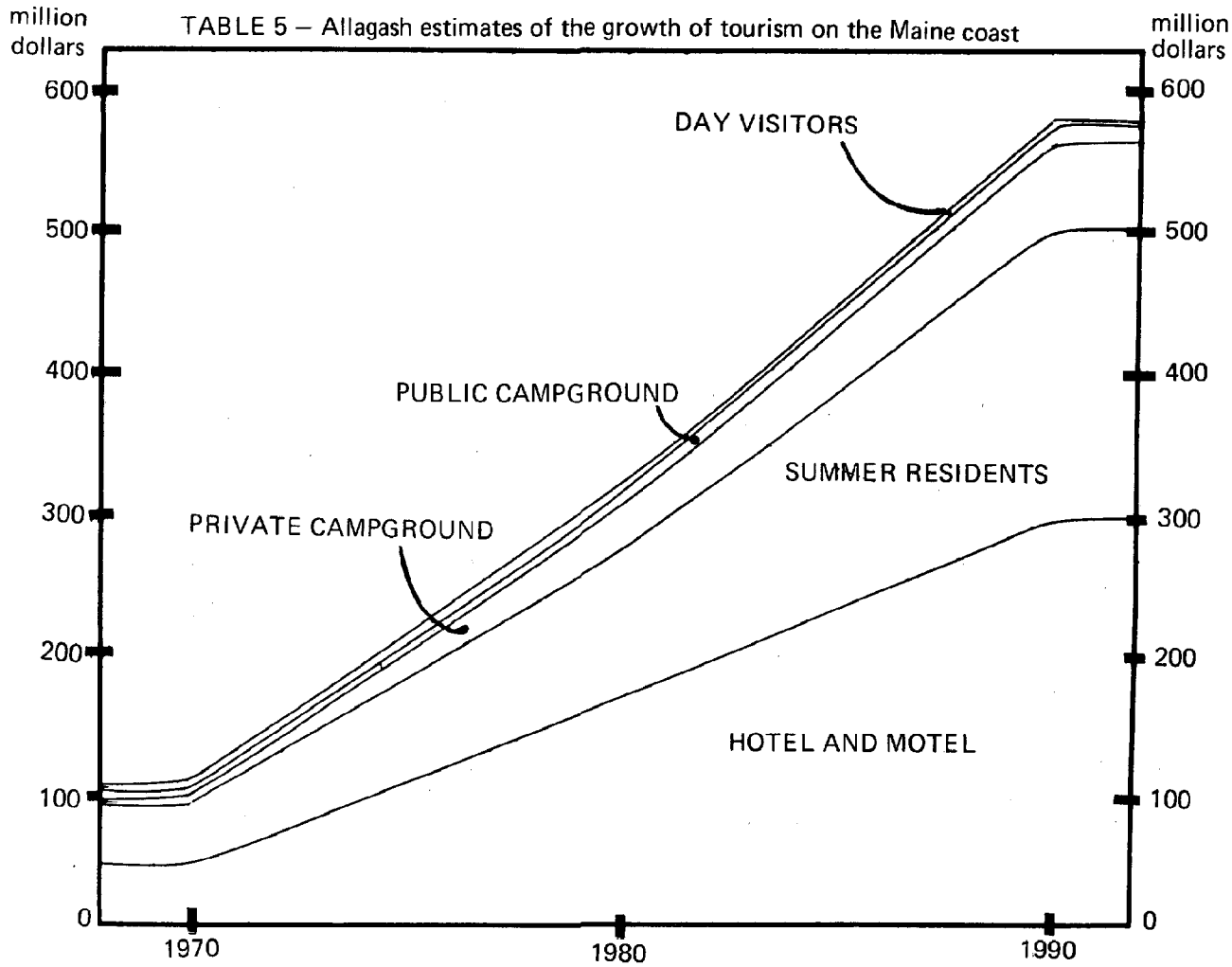
Table 5 summarizes our projection by presenting our estimate of visitor days, revised to include day visitors, and our estimate of total tourist expenditure, obtained by multiplying the estimate of visitor days by the expenditures per visitor day, presented Panel B of

Table 2. The reader should note that this is an estimate for coastal tourism only. It assumes no major changes in tourism in the interior which would drain off demand from the Coast. Inland tourism, other than skiing, is regarded as an area which takes overflow from the Coast in the future.

TABLE 5 – Allagash estimates of the growth of tourism on the Maine coast




| type of lodging | millions of visitor days | | | millions of dollars | | |
|---|---|---|---|---|---|---|
| | 1970 | 1980 | 1990 | 1970 | 1980 | 1990 |
| summer residents | 6.0 | 11.0 | 16.9 | 44.0 | 104.5 | 202.8 |
| hotel and motel | 2.4 | 5.6 | 8.5 | 18.0 | 168.0 | 297.5 |
| public campground | 0.3 | 0.7 | 1.0 | 1.2 | 3.9 | 7.5 |
| private campground | 2.1 | 4.9 | 7.4 | 9.4 | 31.9 | 62.9 |
| day visitors | 1.5 | 1.8 | 1.8 | 1.7 | 3.2 | 4.5 |
| total | 12.3 | 24.0 | 35.6 | 104.3 | 311.5 | 575.2 |

C. Difference Table (Allagash – Veazie )

| type of lodging | millions of visitor days | | | millions of dollars | | |
|---|---|---|---|---|---|---|
| | 1970 | 1980 | 1990 | 1970 | 1980 | 1990 |
| summer residents | 0 | 2.0 | 4.9 | 0 | 44.5 | 122.8 |
| hotel and motel | 0 | 0 | 0 | 0 | 56.0 | 127.5 |
| public campground | 0 | 0 | 0 | -.8 | - .1 | 2.5 |
| private campground | 0 | 0 | 0 | -.3 | 6.9 | 25.9 |
| day visitors | 1.5 | 1.8 | 1.8 | 1.7 | 3.2 | 4.5 |
| total | 1.5 | 3.8 | 6.7 | .6 | 110.5 | 283.2 |

The next few paragraphs examine briefly some of the factors we feel will influence the spatial character of tourist related developments on the Coast.

LOCATION OF FUTURE DEVELOPMENTS: We expect most of the future growth in campsites, second homes and the accompanying retail and service firms to occur to the east of Boothbay Harbor. This will occur in large part because of previous development and rising land prices in the area to the south and west.

INFLUENCE OF ROAD NETWORK: We feel it important to point out that we do not feel the continued concentration of recreational development on the Coast is a reflection of any superior attributes the Coast has to offer recreation-seekers. As development proceeds east, the colder waters, lack of sandy beaches, shorter warm season and lack of cultural amenities suggest an area hardly as attractive for development as many inland areas to the Southwest. In short, we do not feel it is the Coast itself which is attracting development.

Instead of recreational assets, the pattern of recreation development in Maine is in large part a function of the existing transportation network. For most people, accessibility is measured in driving time, not miles. With the notable exception of Interstate 95, the lack of new road mileage in twenty years in most of the areas outside the Coastal zone is indicative of the inaccessibility of many inland bodies of water with superior attributes for outdoor recreation.

DENSITY OF NEW DEVELOPMENT: Given the existing transportation, greater and greater densities of business and second home development can be expected along the eastern coast. In part, this density will result from the limited land available with assured access to the water. These land prices are nothing but an economic manifestation of the land shortage imposed by the existing highway pattern.

SUMMARY: This section has established rough numerical estimates of the seasonal population flows which the Maine coast can expect during the next 18 years. The tentative nature of these figures cannot be overemphasized. All are based on indirect indicators on tourist activity rather than actual studies of tourist behaviour. Any conclusions drawn from these numbers, which are sensitive to a fluctuation of 20 - 30%, are unfounded. Estimates for years after 1980 should be used only to indicate directions of change rather than estimates of population or expenditure.

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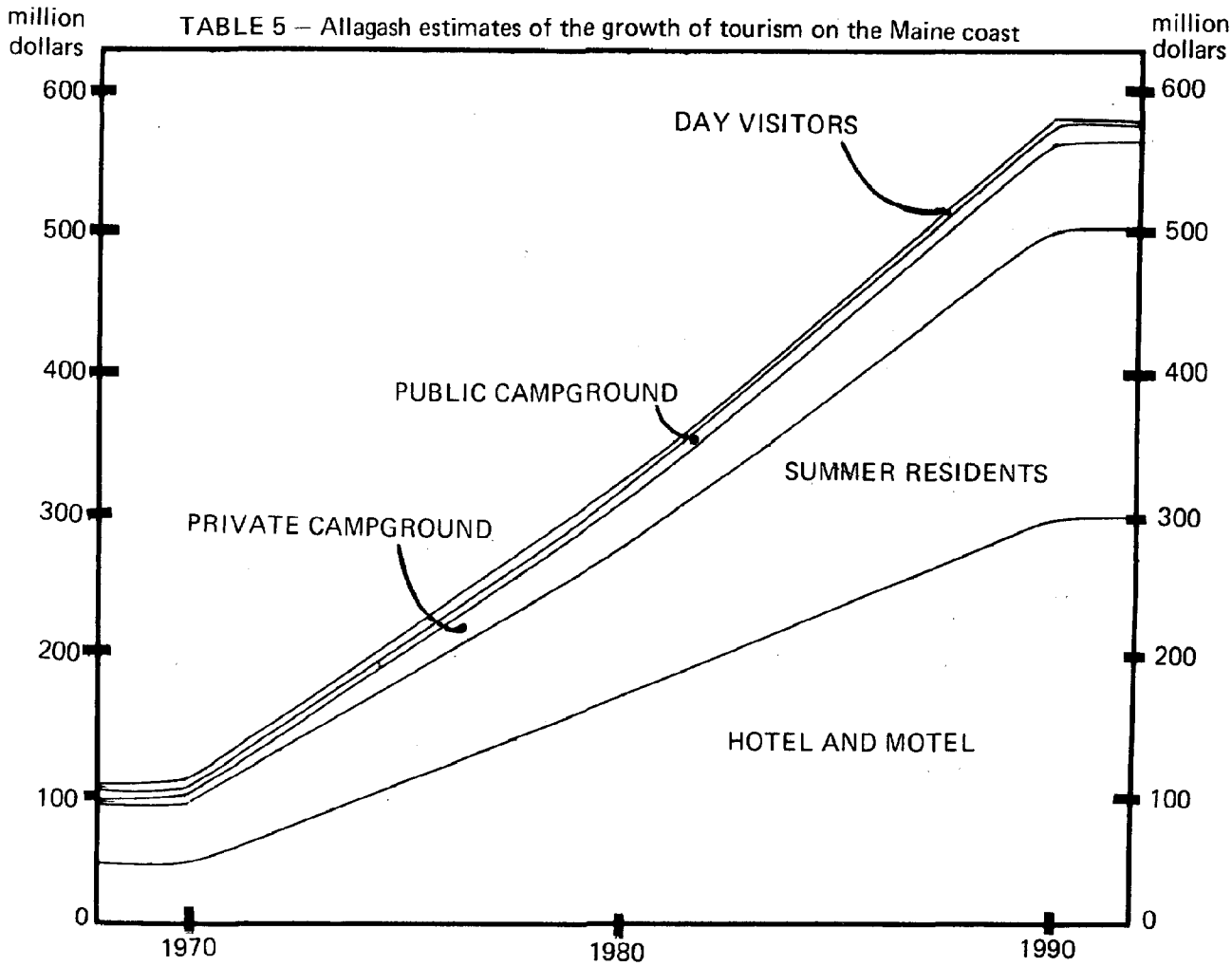


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* * * *

**Consequences of Predicted Trends on the Maine Coast**

THE PROBLEM OF PEOPLE POLLUTION: Many recent studies emphasize the tremendous harm which can be done to the environment by the effluents dischargedby heavy industry. The purpose of this section of our report is to examine some of the problems which can result from large increases in seasonal populations. In our opinion, poorly planned development of tourism, recreation and second home industries can be almost as physically and socially harmful to the Maine Coast as any conceivable concentration of heavy industry.

ENVIRONMENTAL PROBLEMS: Just like industry, the large numbers of people who come to Maine in the summer require certain water supplies and discharge certain solid and liquid wastes which must be decomposed either through natural processes in bodies of water or through treatment in man-made facilities. Today, the Environmental Improvement Commission makes sure industries have access to adequate water supplies and can properly dispose of their wastes before allowing them to operate. For most businesses and seasonal homes, this is not the case.

COASTAL WATER SUPPLIES: Table 6 shows projected peak demands for water along the Coast based on estimates of summer recreation populations. Allowing for the inaccuracy of our estimates, it still appears peak demands for potable water will double by 1990. This does not allow for water demanded by the resident population or by any industries which might locate on the Coast.

TABLE 6

| Year | Water Demand (gallon) | % of 1970 |
|---|---|---|
| 1970 | 676,500,000 | 100.00 |
| 1980 | 1,320,000,000 | 195.10 |
| 1990 | 1,958,000,000 | 289,40 |

Note per capita water consumption = 55 gallons.

Today, almost the entire water supply for Coastal communities comes from groundwater supplies. At present, we know the Coastal aquafier to be an irregular formation consisting of many pockets with complex recharge patterns. Because of this complex pattern and despite the reliance of Coastal towns on groundwater, it is safe to say that no one knows or can accurately predict the minimum twenty-year reliable flow. There is no official record of wells dug and operating and no state law regulating extraction of groundwater by well owners. Without adequate planning and regulation, large increases in seasonal population can cause local water shortages requiring expensive public investment in surface collection and distribution systems to meet peak needs. We certainly cannot predict where, when or if such shortages may occur. If extensive development is allowed to occur before someone can answer this question with assurance, there is a danger not only of water shortage, but also of reducing ground water reserves to levels which may cause local salinization or pollution from adjacent surface streams and rivers.

WASTE TREATMENT: In the coming years, individuals and municipalities are going to be spending literally millions of dollars on waste treatment facilities. This expenditure, in accordance with environmental standards, should stop much of the discharge of raw human sewage into Maine waters. It is hoped this program will raise the quality of many inland waters as well as opening the clam beds currently closed by coliform and viral pollution.

Despite the power of the law and the resolve of state agencies, we are not completely convinced the ending of untreated discharges will be sufficient to solve the coliform pollution problem. There are two elements of uncertainty: the problem of adequate inspection and the effectiveness of approved waste treatment methods.

The Environmental Improvement Commission (E.I.C.) currently has a staff of limited size. The agency presently has some difficulty investigating all the complaints which come into its office. It would be almost impossible to believe E.I.C. can effectively police the thousands of scattered homes along the coast which will not be served by a municipal facility.

These scattered homes pose an additional problem. At present, the E.I.C. regards septic tanks as an acceptable form of waste treatment. However, it seems septic tanks do not work well on the Maine coast. In theory, the tanks discharge sewage which has already been broken down by anaerobic bacteria. This discharge still contains the viruses and coliform bacteria which could close the clam flats. In theory, these bacteria will be trapped as the discharge is filtered through the soil and there be destoryed by organisms in the soil.

In Maine, everything is fine until the wastes are discharged from the tanks. But the subsoils of the Coast are not loams or other porous soils, they are impervious Penobscot clays and rock. There is little filtering soil to trap bacteria. Instead the discharges flow intact for long distances and may even reach rivers, lakes or the sea in this form.

Septic tanks can certainly decrease the bioligical oxygen demand generated by raw sewage, but in Maine, it is not clear they can deal with bacterial pollution. In they cannot, the projected heavy growth in seasonal population can do harm in two ways.

As with Coastal water supplies, no one can say with certainty what volume of sewage can safely be disposed of through septic tanks. There is also the problem of fissures in bedrock layers. Most people assume that rock-bound water streams are inherently pure. This is normally true, but assume the ground water level remains high. If there are heavy withdrawals of ground water coupled with heavy discharges of sewage into the aquafier, it is possible coliform bacteria will reach the level of well intakes. Either source of ground water pollution would, of course, cause a serious public health hazard.

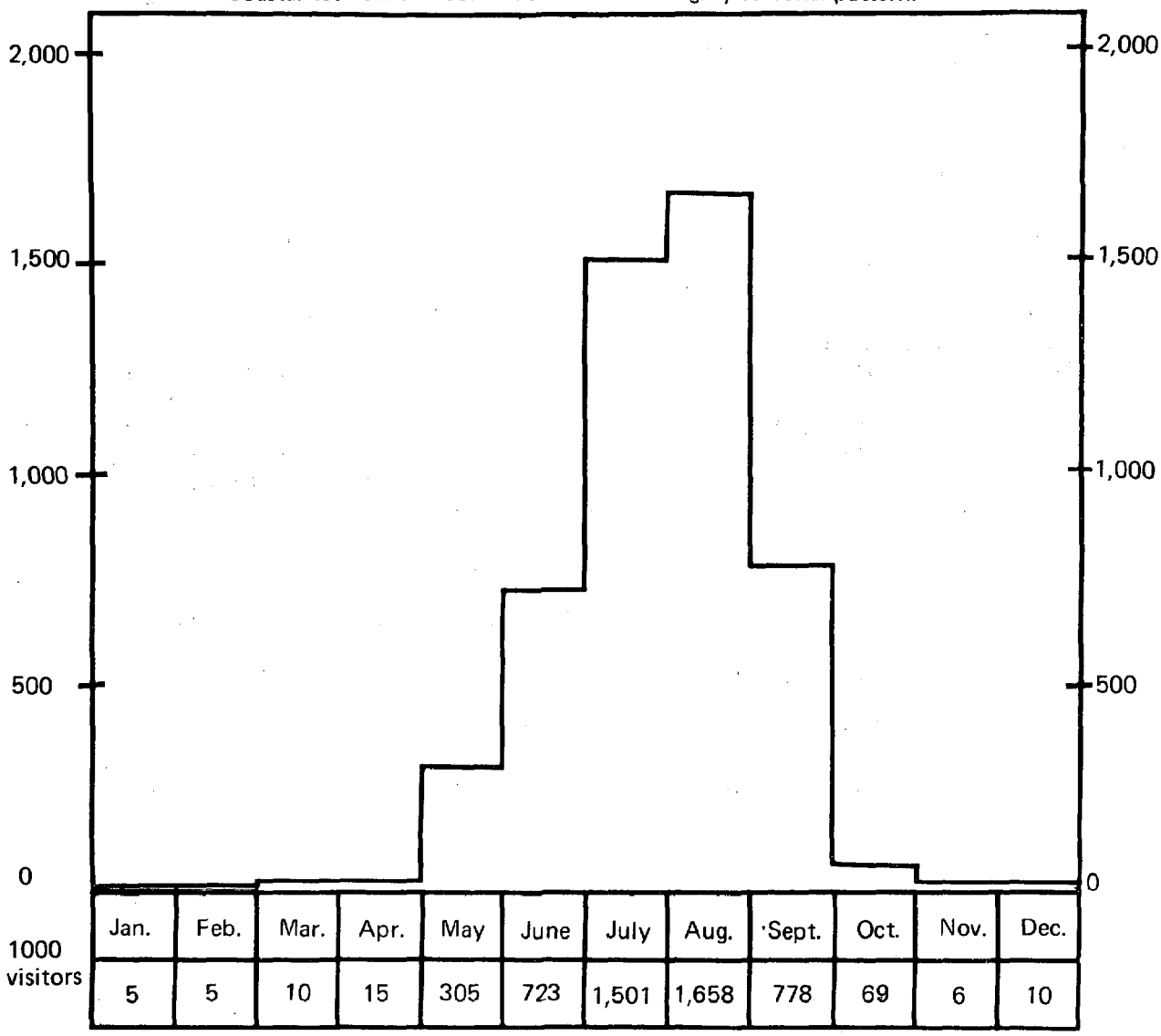
PEOPLE POLLUTION OF THE SEA: Because of the impervious nature of Maine's soils, especially the Penobscot clay which predominates along the Coast, many of the bacteria in water released from septic tanks are not retained in the soil, but flow into lakes and streams or directly into the sea. In inland lakes, this coliform bacteria has the property of causing accelerated growth in algae and other plant-life which in turn generates a heavy biological oxygen demand on the water. This may not only render the water unpleasant for recreation, but can also destroy the more desirable forms of fish.

In the sea, these bacteria are washed into the intertidal zone where they are often collected and concentrated by shellfish. At present 50% of Maine's coastal shellfish resources

are closed as a result of this type of pollution. Increases in the density of seasonal populations in the western part of the Coast and introduction of new seasonal concentrations in currently unpolluted areas can, if proper action is not taken, extend and perpetuate the loss of Maine's shellfish resource. Later in this report we will discuss the social harm which could accompany this major economic loss.

Ground water pollution, dead streams and lakes; unusable marine resources are an environmental loss whether they are the result of pulp mills, oil spills or unplanned and unregulated surges in population. Choosing a future for the Maine Coast which excludes heavy industry does not eliminate the problem of maintaining environmental quality. Given the incremental, decentralized nature of this non-industrial coastal development, it is not even

Coastal tourism will continue to follow a highly seasonal pattern.




By 1990, peak tourist populations will exceed the permanent, non-urban coastal population.

1990 Permanent Population 517,000
1990 Peak Tourist Population 580,000

At many points along the coast, peak tourist populations will be 500% - 600% of the permanent population.

clear that the problem is made easier by banning heavy industry. Demands on resources by large industries are at least easily detected. Further, large companies usually can provide the expertise necessary to help plan resource use and select areas capable of meeting their needs. Most developers of hotels and second homes lack this expertise. Furthermore, the dispersion of recreation businesses and second homes makes monitoring and enforcement quite expensive. Many opponents of heavy industry, recognizing Maine's need for new jobs have held out tourism as an environmental panacea. As usual, there is no such thing as a free lunch.

SOCIAL PROBLEMS: Even the large number of visitor days cannot accurately convey the social impact tourism will have on the Coast. As at present, the great bulk of these visits will occur in July and August. Table 7 gives one estimate of the number of visitors which will come to the Coast in 1990. By 1990. the permanent non-urban population of the coastal counties (excluding Portland, South Portland and Brunswick) should reach 517,000 This assumes the current rate of population growth persists.

With these estimates, we think it likely that during August, the peak tourist population will exceed the permanent population for the coastal counties. Of course, in some localities, summer population is already 200 - 300% of permanent population. In these areas, and in other tourist attractions and developments yet to be created, peak populations may reach 500 - 600% of the permanent population.

The projected massive infusion of population into the state cannot help but affect the social structure of the Coastal communities. Congestion of the roads, parks and beaches deprives Maine people of their use. Increasing ownership of coastal land by seasonal residents breaks down stable social pattern based on geographic relationships. The type of service jobs generated by the flow of people may, in the opinion of some commentators, turn the individualistic people of the coast into a servant class. Massive fluctuations in population density tend to break down social norms as people lose identity in a mass of people with different values and behaviour patterns.

SUMMARY: This section of the report has discussed the potential social and environmental consequences of the growth in seasonal population we feel is likely on the Maine Coast. We conclude that even without heavy industry there will be severe threats to the quality of the coastal environment. Further, the social stresses such a development pattern generates may destroy several aspects of the Maine culture and personality. Commitment to this course of Coastal development by the State government will require no less effort in planning, monitoring and policy implementation than a course based on the introduction of heavy industry.

* * * *

**A Brief Look at the Activities Which Comprise the "Non-Industrial Future"**

FOCUS: We do not intend this section of the report as a comprehensive evaluation of the activities which comprise the non-industrial future for the Coast. What we intend to do is highlight some of the issues which surround these activities and point out in general terms which activities seem to deserve the most attention from state government. The activities we will examine are:

1. Tourism and Recreation
2. Second Home Development
3. Fishing and Aquaculture
4. Light Industry
5. Retail and Consumer Service Firms

TOURISM AND RECREATION: In looking at Tourism and Recreation, we are taking a strict Maine point of view. We assume the aim is to make Maine's scenic resources yield the largest long-term benefits for Mainers. As such, we do not postulate concern that lower income groups from other states may be cut out of the Maine recreation market as long as this does not reduce total revenue; we do not recognize an obligation on Maine's part to provide inexpensive recreation to citizens of wealthy states.

This being the case, our examination focuses on the current inability of Maine business to extract large expenditures per visitor day. We will briefly discuss the growing trend toward campers and day visitors, the lack of spending opportunities and the pattern of development we foresee in the tourism and recreation sector. In this section, tourism and recreation is defined to exclude second home owners. These will be discussed separately in the next section.

CAMPERS AND DAY-VISITORS: One of the most striking features in the Base Data (1970) on seasonal populations is the large percentage which is composed of Campers and Day Visitors. While these individuals constitute 32% of the total visitor days, they are only 12% of tourist expenditures. Another aspect of these two groups is that they, more than summer residents are in direct competition with Maine residents for scarce space in State Parks and on Maine's limited supply of sandy beaches.

With this competition offset by only small economic benefits to the state, it is unclear whether State Government ought to be neutral to the growth of these groups. Unless some policy can be adopted to increase their average daily expenditure, it may be desirable to limit developments which encourage day visitors and campers and consider policies which restrict their numbers and make compulsory charges on them to offset the investment the state and local governments make to meet the peak demands they generate.

LACK OF INCOME-PRODUCING RECREATIONAL ACTIVITIES: It may be somewhat unfair to blame campers and day visitors for their low expenditures. In part we believe this to be a result of the lack of opportunities for the tourist to spend his money. Maine has failed to develop the sorts of businesses which can pleasantly separate the tourist from his money. There are none of the resorts which characterize the Catskills, it is even difficult in most places to rent a sail or powerboat for a short cruise. Anyone who has looked for any entertainment on the Coast after dark will find little more than a few cinemas showing movies he saw six months previously in New York or Boston.

We are not entirely sure what to suggest to make tourism a greater income earner. If the Maine culture would accept it, something like state-run casinos would seem the natural answer.

PATTERN OF DEVELOPMENT: As we stated in a previous section, most tourists go to the Coast not because of its superiority to the rest of Maine as a recreation area, but because it is the only part of the state easily accessible via the existing road network. The results of allowing the road pattern to determine residential and commercial development rather than determination by planning is obvious: roadside "strip" development. This type of land use can normally be characterized as visually unpleasing, inefficient relative to the cost of providing public services, and wasteful in its use of open space.

The alternative to strip development is planned clusters of improvements with buffers of open space. Such developments, combining residential and commercial uses, can preserve open space while allowing public services to be provided less expensively. But cluster development requires laws and institutions capable of planning and controlling land use. This means not only zoning, but a whole range of techniques to assure public access to scenic resources and minimum disruption of wild land.

Almost without exception, the jurisdictions on the Coast are lacking in even the most rudimentary of land-use controls. The situation has become so bad in parts of York and Cumberland Counties that the MCRR study labeled them recreational slums. There is no reason to believe that the situation will be any different in other parts of the coast unless some action is taken to carefully control land development. Despite the strong tradition of local government in the Coastal towns, if they refuse to take effective action in this matter, we feel it is the clear obligation of the state to occupy the field through existing and future State zoning and land-use controls. In addition to these negative powers, we feel there are several ways the State can take the initiative in guiding recreational land development. These ideas will be discussed further in the final section of our report.

PUBLIC BENEFITS OF TOURISM: While many small businessmen have undoubtedly been profiting from the tourist flood, we do not feel the State treasury has benefitted to the extent it could. We are aware that there are constitutional provisions limiting the ability of State Government to make laws discriminating against citizens of other states, however, we do feel there are revenue policies which can take advantage of the seasonality of tourism to escape these limitations.

One possible mechanism is introducing a seasonal sales tax. This would have two effects. First, it would be legal since it treats all citizens alike regardless of state of origin. At the same time, it would redistribute the tax burden to those who buy during the summer months. This in effect would put a greater tax burden on out-of-state visitors.

The second effect of the seasonal tax is to encourage Maine residents to do their buying during the low tax period. This should redistribute retail buying patterns and in some measure reduce the seasonal swings in retail employment.

A second mechanism would be higher taxes on goods and services associated with tourism. Such a tax might be applied to campgrounds, hotels, motels, restaurants and other public amusements.

A third revenue measure would be the imposition of a state capital gains tax above and beyond that contained in the present income tax. The rationale for such a tax is that much of the economic gains from tourism have come in the form of increased values on real estate and real estate improvements. Sales of appreciated real property have resulted in windfall gains to owners which is, in most cases, unearned income . . . That is, the increase in value of the asset has resulted not from any action of the owner, but from the general desirability of the Maine environment. Thus the increase in value really belongs to the society as a whole and the State, as agent for the society, should capture part or all of the increment in value. In short, we see a capital gains tax as one which could produce substantial revenues with few inequities.

The purpose of these taxes can be construed in one of two ways. One use is to improve the ability of the State to provide the additional executive functions rapid economic development requires. The other possibility is to use such funds to offset local taxes in Coastal communities. In either case, the effect of tourist related taxes would be to extract greater income from the State's resources for the people of Maine.

There is some feeling, both in State government and in the business community, that taxation policies which in effect discriminated against tourists would destroy the Maine tourist industry. Somehow, these people feel, even slight increases in the overall cost of a Maine vacation would reduce the demand for Maine resources sufficiently to result in a lower total economic product. There is, of course, no conclusive answer to this question. However, we have adopted the opposite viewpoint. We do not feel that a 5%, 10% or even 15% increase in the cost of a Maine vacation due to taxes would have any more effect than similar cost increases that have occurred over the past few years as a result of increases in the prices of food and lodging. The demand for vacations in Maine is strong and, we feel, relatively insensitive to the price of the vacation. We can thus recommend such taxation with confidence that it will result in a net addition to the economic product of tourism in Maine.

SUMMARY: This discussion of tourism and recreation is not intended as an overall review of state policy. It has argued that this industry lacks planning in development of new products and services, in land use and does not contribute as much to the State treasury as it reasonably could. We feel much of the potential contribution of tourism to the state economy has remained latent due to the lack of bold initiatives either in the private sector or in State government.

SECOND HOME DEVELOPMENT: There are several reasons we feel home development and second home owners should be considered separately from other seasonal visitors to Maine. First, their average length of stay is more than ten times that of campers, day visitors and people staying in hotels and motels. Thus their consumption pattern should be somewhat different. Second, they are the only class of seasonal visitors who can be considered to invest in Maine as well as consume its resources. Having such an investment, second home owners can be expected to take more of an interest in the long term quality of Coastal resources. Finally, the spatial distribution of second home owners is less fluid than that of campers; the greater economic life of homes versus campsites means the effects of poorly planned second home developments will be with us far longer than poorly planned campsites. Our discussion of second homes centers around these differences. We feel that because of their longer stays and less peaked occupancy patterns, second home owners can provide greater economic benefits to the State than any other form of tourism. At the same time, the second home by its environmental impact and longevity can cause greater harm than any other seasonal accommodation if not properly planned for by State and local government.

ECONOMIC BENEFITS OF SECOND HOMES: While additional spending by tourists is beneficial to Maine, additional tourists are not. From a selfish point of view Maine wants the maximum income from the minimum number of visitors. From this point of view, second homes are clearly preferable to any other form of tourism. Not counting investment, Professor Askari estimates the annual spending of one seasonal resident family (200 visitor-days) to be equal to 511 visitor days of camping. Stated another way, it would take only 4700 additional summer homes to equal the expenditures of all the campers who came to Maine in 1970. Needless to say, such a substitution would also have meant less congestion on the highways, less competition with Maine residents for camping facilities in State Parks.

Second homes benefit Maine through investment as well as consumption. The price of a new summer residence in Maine can range from $16000 to $50000. Even a mass produced 3-bedroom detached house with 960 square feet of useable area will cost $17000 – $20000. Condominium units can cost from $16000 – $40000. Wealthy individuals can build homes costing far more.

Not all summer residences will be new construction. Many people will choose to take an existing farm house and remodel it to their tastes. Assuming most such conversions will involve new plumbing, kitchens, roofs and interior-exterior finish work, a good estimate of average remodeling cost for the next few years would be $8000. The price of the old house, of course, is not counted as investment.

The interesting figure for Maine is not the total investment, but the amount of that investment that goes to Maine firms and workers. At least in theory, all the labor and materials could come from Maine with the exception of metal goods, appliances and fixtures and possibly the architect. Given existing price relationships, this would mean 65% of the value of summer residence investment should stay in Maine. This in turn suggests that construction will have a high expenditure multiplier and a positive effect on Maine's economy.

One of the major imponderables in projecting residential investment is the effect of future building codes and consumer tastes. The interaction of these two will determine not only what people want to build, but also the minimum they can spend to build it. This makes it difficult to estimate a figure for total construction. We also have no basis for predicting how many summer residences will be new construction and how many will be rehabilitation of existing dwellings. Having made these disclaimers, we can speculate

that, in current dollars, average new investment in a summer residence will be about $18000. Multiplying this by the projected increase in the numer of new residences — 23,000 by 1990 — we can say we expect new investment of $414,000 during the projection period.

The second home owner has another characteristic which makes him desirable from the perspective of land use planning. His stay in Maine is, on average, several weeks as opposed to the camper's three or four days. Since acceptable travel times between point of origin and destination increase as anticipated length of stay increases, the second home owner should be willing to drive much longer distances than the camper. This makes it much easier to divert second home development inland to take population pressure off the coast. Locating second homes away from the Coast is not only beneficial to the State, but also brings advantages to the summer resident: distance will tend to isolate him from the flows of more transient visitors. Thus, at least in the short run, inland locations will protect the home owner from the congestion of roads and facilities he now must contend with.

PROBLEMS WITH SECOND HOMES: The arguments for encouraging second home development relative to other forms of tourism in Maine do not erase the very real problems of water supply and pollution from human wastes presented above. At present State Government has relatively little authority with which to direct summer home development in a manner to overcome these problems. It is quite likely that as second home development continues, State Government will find it advisable to establish additional building and land-use controls which will require new construction to be located in a pattern amenable to efficient public water supply and collective waste treatment.

SUMMARY: This section has described the advantages of second home development over other forms of tourism. Besides the economic charactertistics presented at length in the Askari report, the point was made that second homes are much more flexible in their locational preferences than shorter term visitors. In terms of the problems of water supply and waste treatment which are either occurring now or can be anticipated in the future, this locational flexibility will be important. The point was made that the state may need to take a greater hand in regulating the pattern of second home development.

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FISHING AND AQUACULTURE: In recent years there has been a growing interest in some form of intensive cultivation of marine resources – aquaculture. This section will look briefly at the prospects for aquaculture in the near future. It will then examine the effects of development on existing marine resources.

AQUACULTURE: While recognizing the theoretical potential of aquaculture, we do not feel it will make a significant commercial contribution to the Maine Coast in the foreseeable future. By foreseeable future, we mean approximately the next ten years. We do not think it can be commercially important in less than ten years under any circumstances. Whether it becomes important after that seems highly dependent on whether certain institutional changes occur which we have no way of predicting.

The institutional problems confronting commercial aquaculture have been spelled out clearly in Harriet Henry's paper "Maine Law, Aquaculture and Aquaculture Potential." This paper is reproduced as an appendix to the MCRR study. We see no reason to rehash those arguments here. Suffice it to say that problems of exclusive use rights and allowable lease periods should be sufficient to deter private investment.

Even if these institutional problems did not exist, we feel aquaculture has a long way to go from its present level of technology to a major production technology. As in any industry, there are always problems in moving from the laboratory to the production line. One clear need of aquaculture in Maine is one or more pilot projects of commercial size to work out problems such as water recycling, disease control, marketing and breed improvement.

We do not suffer from the lack of data in this area which we encounter in discussing the tourist industry. In the MCRR study, there are three sets of figures describing the finances of lobster, oyster and trout-salmon enterprises. Unhappily, these figures describe strictly marginal enterprises. Even granting the favorable assumptions these figures make about interest rates, product prices and cash flow, net income is at most 15% of sales (lobster) and reaches less than 1% (oyster). Such margins might be acceptable in mature industries with stable markets and technologies. They are clearly unacceptable in an industry lacking a proven technology, experienced managers or established marketing arrangements. Fairly minor changes in the assumptions made in MCRR will cause these enterprises to show negative net incomes. Thus, even with appropriate institutional arrangements we do not feel aquaculture will soon make a significant contribution to Maine's coastal economy.

There is a final argument against reliance on aquaculture. Aquaculture will shift extraction of marine resources to a technology more capital intensive than that used at present. In a state where the search for new jobs is as frantic as in Maine, any shift away from labor intensive technology may be a mistake. We are not strongly convinced by this argument. Demand for most of the marine products suitable for production via aquaculture is strong enough to sustain additional supplies with only slight drops in price. This suggests jobs created in aquaculture would not destroy jobs in the traditional sector. However, granting exclusive rights in subtidal land may bar some people from informal employment such as clamdigging. Such a move would have effects similar in nature to land enclosure movements in other countries. In short, those for whom the common clam beds are a source of working-welfare

might be denied this income and would, in all liklihood, add their names to the public relief roles. Even if these costs could be recaptured by the state in leasing fees, it is fairly clear such a pattern is not socially desirable.

TRADITIONAL FISHING: At present, the most widespread harm to traditional marine enterprise comes not from oil or hot water, but from the untreated human sewage discharges into Maine's waters and shellfish beds. This loss of clam production will be decreased as new municipal treatment facilities come on line in heavily populated segments of the coast.

However, as argued above, we are still concerned that pollution will persist as a result of the large increases of seasonal population and the use of septic tanks as the form of waste treatment in many of the areas of heavy tourist use. No one can prove such pollution will not occur. Our concern is that the argument seems plausible and we have been unable to find data to disprove it.

There has been much made of the need to subtract losses in marine resources from the benefits of oil operations. There has been little work done, academically or bureaucratically, on the costs which must be subtracted from the economic contribution of tourism. We do know, however, that the figure is measured in millions of dollars in landed value. Further this cost is incurred by the poorest segments of Maine society. We believe this is an important situation; one which makes the argument, in human and economic terms as well, that the State must take a hand in planning and enforcing environmental standards on tourist related enterprises just as it now does on industry.

SUMMARY: The major issue in marine resources is not aquaculture. For legal, technical and economic reasons this activity will not make a significant economic contribution in the foreseeable future. The major issue at present is the loss of shellfish resources to people pollution. This section points up that banning industry will not always solve the problem of coastal pollution.

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LIGHT INDUSTRY: One of State government's well publicized efforts for the past decade has been its attempt to attract high-wage, non-polluting industry to Maine. While there has been long and heated discussion about how successful this effort has been, it is clear it has not been successful enough to bring Maine's unemployment and average income statistics in line with those of other New England states.

Here we are concerned with a more limited question: will that light industry which does locate in Maine locate on the Coast? In a word, we think the answer is no. We do not feel that increases in the numer of firms or expansion of existing firms engaged in light industry will be a significant source of economic growth on the Maine coast.

One reason for this conclusion is that there are few firms with specific reason to locate on the coast. Only those requiring access to water transportation or marine resources would have need of the production factors the Coast can offer. If a coastal location is not required, the Coast will have to compete with other parts of the state for industry.

The recent report prepared for The Allagash Group by Richard Barringer discusses at length the proposition that most of Maine's light industrial growth will occur in the Portland to Bangor corridor. We find no reason to take exception to this proposition or to reproduce it at length. We thus limit our argument to a brief discussion of three factors which support the proposition.

Most light industry depends far more on air and road transportation than on port facilities. Thus light industry should continue to cluster at airports such as Portland and Bangor and along high speed roads such as the Maine Turnpike.

One of the most pronounced economic trends along the Coast has been the rapid increase in land prices. This trend is either not present or not as advanced in many inland areas. We would expect industry to choose areas with lower land prices, other factors being equal.

Finally, the pattern of industry location in this corridor will, as time goes by, make the corridor more and more attractive relative to the coast. This is due to the economies which accrue from firms being able to share common services and to attract ancillary suppliers and customers by geographic concentration.

SUMMARY: The light industry which comes to Maine will continue to concentrate in the inland corridor rather than on the Coast. Light industry will not be a significant source of economic growth for the area of the Coast east of Portland.

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RESEARCH AND EDUCATIONAL FACILITIES: There has been hope voiced in some quarters that the Maine Coast would come to be the location for a series of educational institutions and marine research facilities. In part, this hope is already being realized with the founding of the College of the Atlantic and the expansion of the Jackson Laboratory. It is unclear what Maine can do to attract such facilities; anymore than it can do to attract non-polluting industries. Perhaps the most Maine can do is remain a clean place for such pursuits. With this in mind, we will examine the probable effects of people pollution on research and education. Secondly, we will look at the benefits which might be derived if research and higher education did locate on the Coast.

EFFECTS OF PEOPLE POLLUTION: We find it difficult to believe either research or educational institutions will select coastal locations south of Penobscot Bay. Congestion and high land prices are hardly what these organizations seek in Maine. The question is how long it will be before tourist development pre-empts research and education from the rest of the coast. We think that 1980 may be the last year in which it would be possible for major educational facilities to find coastal land at prices they could afford.

This does not mean research and educational organizations will not come to Maine. But those that do will increasingly seek inland locations in order to afford the land they need not only for physical plant but as a buffer from adjacent uses. In short, we do not anticipate many organizations of this type will locate on the coast unless sizable parcels of land can be made available at below market prices. This should only be done if research and education can be shown to yield more than compensating benefits to the state. We address this question next.

EMPLOYMENT AND TAX BENEFITS OF RESEARCH AND EDUCATIONAL INSTITUTIONS: The tax and employment of research and education (R & E) are unclear. In the first place, most of these organizations would be exempt from state taxes. This means any benefits would have to come from employment. Such benefits, to make research and education desirable, would have to off-set the public service costs incurred by these institutions.

We doubt high level R & E would employ many unemployed Maine residents. Most of the high-wage jobs in such organizations would go to out-of-state specialists. These people might eventually consider themselves Mainers, but the jobs they fill will do little to alleviate unemployment in Maine. There should be some middle-level technical and administrative posts which will be filled by graduates of Maine colleges. To the extent that it is desirable to reduce the outmigration of these groups, this is a desirable addition to the job stock. However, we presume these people would have had no trouble getting jobs, albeit not in Maine. Middle level jobs effect the migration problem, not the unemployment problem.

Most of the remaining jobs in R & E relate to the house-keeping chores of any large company, augmented by any residential component. Such jobs are quite similar to those now found in tourism. They are superior to tourism jobs in that employment is not seasonal and wages and fringe benefits will be better. Many of these jobs will be available to unskilled workers. They constitute the real addition to employment in Maine.

The major benefits of such institutions would accrue to the retail and service businesses which would grow up around any major organization. These firms are the second stage of the multiplier effect. Economic contribution by this sector is measure in value added and thus depends on Maine's ability to produce specific goods. Rather than examine the retail and service effects of firms supplying R & E firms and employees, we will discuss the entire Coastal retail and service sector in the next section of the paper.

SUMMARY: It is impossible to generalize on the contribution any R & E organization would make. One characteristic of such firms is their individuality. Numbers and proportions of professional, technical and unskilled workers will vary with both the size and purpose of the institution. We are unclear as to what contribution new entries in these fields will make in the State economy. We are, however, fairly confident that few additional institutions will locate on the Coast unless they require ocean access as a major input to their activities.

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THE COASTAL RETAIL AND SERVICE SECTOR: On closer examination, it is clear we have been discussing this small business sector in almost all the previous sections. The "tourism industry" in Maine is nothing more than the collection of predominantly small, owner-operated businesses which market goods and services to seasonal visitors. With the exception of the building trades, the same holds true for the second home sector. Most of the benefits from any research or educational development will go predominantly to those selling goods and services to the institution and to its employers as consumers. Only aquaculture does not deliver benefits primarily to Maine retailers. Since we have argued that aquaculture may be relatively unimportant in economic growth in the near future, we are justified in consolidating our analysis of a "non-industrial future for the coast" around the behaviour of these small firms. There are three grounds on which to question the desirability of continuation of the present pattern of growth in this sector. They are:

1. long-term ability to compete with national companies;
2. land use pattern;
3. contribution to Maine's economy.

COMPETITIVE ABILITY: There are two phenomena which could make the Maine small retail sector unstable; overbuilding and competition from national firms and franchises. Motels, restaurants, novelty shops and other tourist retailers are all characterized by markets exhibiting atomistic competition modified by some degree of locational monopoly. That is, the retail and service sector is made up of many classes of firms, with firms within each class offering a relatively undifferentiated product. Most of the differentiation is by location: two restaurants in Belfast may be perfect substitutes for each other, but the one located on US 1 probably does more business than the one on a side road. The retail and service sector has low entry costs and low managerial requirements. If land is available to build on, there is little to stop new competitors from entering the field. Economically, this should keep profits down. It is interesting that overbuilding has not occurred in Maine's tourist oriented retailing to the extent economic theory would predict. Despite rapid increases in seasonal visitors, the number of motel rooms and campsites has increased at only 1 - 3% annually according to Askari.

This can be explained in several ways. Maine tourist facilities are built to meet peak demands and probably to collect 60 - 80% of their annual income during June, July and August. These facilities have a great deal of excess capacity for the remainder of the year. If much of the growth in visitor days has occurred during May, early June and September, it may be that the demand could be met by the existing retail capacity and no new investment was called for.

We feel a more likely explanation of the lack of over-building is the lack of investment capital and management in Maine. This explanation meshes with the lack of other recreational enterprises on the Coast referred to earlier much better than the excess capacity argument. This suggests Maine people have not been very aggressive, or do not have the means to be aggressive in exploiting the tourist market.

Personal observations and anecdotal evidence suggest that more aggressive investors are coming on the scene. In the high volume tourist areas in the southwest part of the Coast, there are increasing numbers of national food and lodging establishments. Such outlets, whether

centrally owned or franchised are likely to be better financed, merchandised and managed than indigenous firms. This is in part a function of consumer recognition. In a MacDonald's, Dairy Queen or Holiday Inn, the traveler feels he knows exactly what he is buying. As we believe most people tend to avoid uncertainty where possible, we feel tourists will increasingly choose nationally known businesses over unknown local firms. This may not occur as far as the better restaurants are concerned. Here people may use price as an index of quality. Besides, there are few, if any nationally known quality restaurants other than those found in lodging chains.

Our fear is that as tourist densities increase, these national firms will increasingly dominate the Maine tourist service and local market. If the firm is nationally owned, the profits will flow out of the state. The only benefit to the state economy would be in wages and in materials purchased locally. As these national operations tend to be more capital intensive than small local operators, the return to labor will decrease.

Even if the outlets are franchised, a significant part of the profit still leaves the state as a franchise fee. The same loss of income to labor occurs as stated above. Franchising is not as harmful to the economy as out-of-state ownership, but the difference is only the difference between total profits and the franchise fee.

In either case, these new firms may have the capital to secure the better locations, break into markets already being served by local firms, and generally compete in a manner which reduces sales by local firms, thus driving some local firms operating on the margin out of business. We feel complete reliance on individual small firms to constitute Maine's tourist industry could result in control of that industry being shifted out of state during the coming years.

LAND USE PATTERN: Most small businesses exist because they are near something rather than because they are a destination in themselves. Tourist-serving firms cluster around state and national parks and along major highways. This is the origin of the strip development pattern objected to earlier. Maine small businessmen have not proved capable of planning or executing major recreational developments which would in themselves attract tourists.

The lack of planned development means an eventual wall to wall strip of motels, moccasin shops and hamburger stands along US 1 from Kittery to Eastport. We do not regard this as desirable, environmentally or economically. We do not think Maine small businessmen are capable of carrying out large coordinated developments. At the same time, large Maine firms have shown little interest in large developments on the Coast. We feel that if Maine is to have well-planned recreational attractions which can not only attract visitors but give them something to spend their money on once they arrive, the State will have to take a hand. Some ideas on what the State might do in this regard are presented in the third section of this paper.

ECONOMIC CONTRIBUTION: There have been many people who have extolled the

benefits of small businesses in Maine and elsewhere. After some inspection of Maine's retail and service sectors, we are not so sure these small units are appropriate as a leading sector in Maine's economic development. We have already discussed their competitive disadvantages and passiveness with regard to land use patterns. Here we will explain briefly three other disadvantages of small businesses relative to large businesses in the state economy.

The first disadvantage of small business is its inability to develop new management and entrepreneurial talent. Obviously most small retail operations do not have anything that could be described even jokingly as "middle management" jobs. There are few positions in small motels or restaurants where a person can learn much about financing, marketing or personnel supervision. Where large business units can teach people skills which are transferable to new enterprises, small business can not.

A second disability of any economy based on small businesses is the inability of many proprietors to reinvest their profits in a manner conducive to economic growth. Most small businessmen in Maine probably deposit their money in savings institutions or speculate in land. As Maine banks reinvest most of their funds in out of state securities, neither of these uses of profits contributes much to the growth of the Maine economy. Larger business units are far more likely to reinvest profits in new outlets or expanded operations.

A third problem with small business is the loss of income and sales tax revenue through underreporting of sales. In any cash transaction business, there is a tendency for owner-operators to underreport earnings and gross sales by simply helping themselves to cash from the register. Such owner-operator behaviour is not limited to retailing. Sea and Shore Fisheries freely admits that reported landed values significantly underreport the true incomes of fishermen. Of course, any such underreporting costs the state tax dollars.

Larger businesses are unlikely to engage in as much evasion. Where the owner is not present at the point of transaction, all monies are usually deposited in bank accounts where a record becomes available for tax validation purposes. We are unclear on the magnitude of present underreporting. A working assumption would be that it was not less than 5% or more than 15% of sales of owner-operated retail and service businesses.

SUMMARY: Despite popular notions to the contrary, we do not feel the scores of of small businesses which now make up Maine's tourist "industry" is the most desirable vehicle for development of the coast. This is not to say that the entire Coast must be handed over to Walt Disney Enterprises. We do feel that the state must exercise a strong planning and control function to establish a legal and spatial framework in which small businesses can be used to obtain greater development and a more desirable land use pattern.

SECTION SUMMARY: This section of the report has discussed the six economic activities we feel together describe the non-industrial future for the Maine Coast. They are

1. Tourism and Recreation
2. Second Home Development
3. Fishing and Aquaculture
4. Research and Educational Institutions
5. Light Industry
6. Retail and Service Businesses

We felt of these, second home development, properly regulated, offered the greatest economic benefits to the Coast with the least social and economic costs. Tourism is certainly of major value, but at present the activities available on the Coast do not seem sufficient to extract from the tourist as many dollars as he would be willing to spend given the opportunity. For technical, legal and financial reasons, we do not feel aquaculture will be of commercial importance for at least 10 years. While research and educational organizations may well find Maine an attractive place to locate, we feel few will choose to locate on the Coast because of the high cost of land.

In all the activities of commercial significance, we found the activity was in reality the sum of goods and services offered by firms which were predominantly small owner-operated retail and service establishments. On balance we did not feel that the "invisible hand" of free enterprise was acting to combine the individual decisions of these firms in a pattern which resulted in the maximum economic growth, best land use or greatest competitive ability for the State as a whole. It is our conclusion that some combination of planning, regulation and market initiatives by the State is necessary if the non-industrial future for the Coast is to combine economic well-being with a high quality natural environment.

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## SECTION II

### Protecting the Coast from People Pollution

FOCUS: This section of the report outlines in general terms our feelings about the policies the State must adopt if the coast is to be maintained in a state of high environmental quality. We note that the object of this report is projection rather than recommendation. This being the case, we have not attempted to prove our recommendations in any strict sense. We are more concerned with identifying policy levers rather than specific policies.

Our basic thesis is that to maintain the desirable ecological and social characteristics of the Coast, both average and peak population densitites must be limited. In theory, this could be accomplished through the negative tools of taxation and land rationing. However, given the economic potential of tourism in Maine we feel such policies might generate too much political debate to be effectively enacted.

As we stated above, we do not feel the Coast per se is what attracts tourists and second home developers to Maine. Rather, the attraction is the availability of open space and a relatively unpolluted environment. The conclusion we draw from this is that with certain actions on the part of State government, much of the demand for recreation now concentrated on the coast can be diverted to inland areas. Indeed, while it would be impossible to prove with existing data, there is reason to believe that greater access to the interior would increase Maine's comparative advantage as an outdoor recreation center. This is because there is a far wider variety of water and winter activities available in Maine's mountain-lake complexes.

In this section we will briefly discuss three policy levers available to State government. They are:

1. Transportation planning
2. Initiation of major resort developments
3. Limitation of average and peak coastal populations

TRANSPORTATION PLANNING: Twenty years ago, Maine's interior was little more than trees and potatoes. Transportation networks were designed to move bulk produce out from a few collection points. Not surprisingly, this transportation network, be it rail or road, does not correspond to the network one would devise to facilitate access to Maine's prime inland recreation areas. Put quite simply, we feel there is a large demand for the types of recreation the Maine interior can provide and this demand remains latent only because there are presently no facilities and no transportation system to get people to facilities conveniently if they existed. Thus we feel state action to expand the contribution of tourism and recreation to the Maine economy should concentrate on careful development of the Maine interior rather than the Coast.

There is always the chicken and egg question. In this case the question is which comes first; the transport system or the income producing facilities? The answer seems relatively simple: private initiatives to construct resort facilities cannot assure government will provide the transportation infra-structure, therefore no facilities will be constructed. On the other hand, firm commitment to provide adequate transportation should call forth private investment or allow government to develop facilities of its own. Thus the commitment to a recreation-oriented transportation system must come first.

We will be the first to admit that there can be substantial disagreement over what modes of transportation are appropriate and how they should be financed. This is a set of issues we will not attempt to resolve here. Suffice it to say that there is sufficient experience with resorts in similar isolated areas and sufficient techniques in hand for demand estimation for such questions to be answered with a great degree of accuracy.

A natural inference that could be drawn from these suggestions is that additional transportation to the coast should be curtailed. As far as construction of new roads is concerned, we feel they definitely should be limited to those made absolutely necessary by industrial or safety considerations. The policy of constructing roads to meet an estimate of what traffic on the coast will be puts the cart well before the horse. Proper land use policy would have us decide how many people we wanted to transport to the coast in a given seasonal distribution and then construct only the roads necessary for this number. Thus we would use congestion as well as other policies discussed below to limit population densities on the Coast.

RESORT DEVELOPMENT: We have already made our arguments against serving recreation demands through unplanned proliferation of small businesses. While on the coast this pattern can hardly be erased, there is no reason to allow the same forms of strip development to extend into presently unspoiled land. This in itself is a strong argument for the State to take a large part in any inland development.

However, there is a much stronger reason. The demand for recreation in Maine is not the result of hard work or wise investment by private industry. It is the result of the state's overall low density of population and the unpolluted nature of Maine's environment. These things are what economists call externalities. In a very real sense these externalities are the common property of the people of Maine. This is implicit in the environmental legislation which forbids individuals to destroy these externalities through pollution. An extension of this argument says that any economic benefit from these externalities should accrue to the people as a whole and not to individual businesses.

On the basis of this argument, we feel State government should take the initiative in developing the recreation potential of the interior, be that development campsites, hamburger stands or full hotel resorts. Similar patterns of public development can be found in countries from Canada to Mexico to Kenya. Revenues from such development can replace taxes such as the general sales and property taxes to some degree, thus relieving some of the regressivity in Maine's overall tax system.

As with transportation planning, these thoughts open a complex can. What sorts of recreation should be developed? How should it be financed? Should the state operate and

finance the facilities or make franchise and management agreements? How should private business operating on the fringe of state developments be treated? Should land be sold to businesses and home builders or merely leased with ownership residing in the state? These and many more questions would have to be resolved before any policy of state development could be successful. One of the greatest uncertainties does not concern the financial feasibility of such projects, but rather whether the voters and legislators will give an executive body the flexibility to operate as a socially conscious business.

Unlike transportation planning, we do not feel new state action should be limited to the interior. Quite to the contrary, one of the areas where state initiative is most crucial is in the areas to the east of Penobscot Bay which to date have not been heavily developed. Here the state has an opportunity to plan and execute developments which concentrate demand so as to allow more tourist expenditures while at the same time limiting the destruction of open-land and insuring all access to the sea and other water resources.

TAXATION AND LAND USE: While we are confident interior development can divert some recreation demand from the Coast, there is no guarantee that the demand remaining for coastal recreation will be at a level consistent with desired social and environmental characteristics. If it is not, then the negative incentives of taxation can serve to redirect additional demand to the interior, and, if excess demand still remains, land use controls can be used to ration access to the coast.

The first tool, taxation, obviously has the effect of raising the price of coastal recreation relative to interior recreation and relative to recreation in other states. Such taxation can be placed on gasoline, roads, lodgings, eating places recreational attractions such as beaches and state parks. This approach would seem to have beneficial side-effects. First, tourist related taxes serve to shift the burden of taxation from Maine residents to seasonal visitors. Second, because expenditures on recreation and tourism occupy an increasing percentage of expenditures should be more progressive than general sales taxes or property taxes. If progressive taxes are viewed as being more equitable than regressive taxes, tourist-related taxes are desirable.

The argument has been advanced that any conscious taxation of tourists would cause animosity towards Maine in the minds of out-of-staters resulting in a drastic reduction in tourist contributions in the state economy. This argument is questionable both on theoretical grounds and on the basis of experience. It is common knowledge that for years coastal communities have been taxing seasonal residents with disproportionate property tax assessments. No one seriously claims that this has significantly reduced the increase in the number of seasonal residents. More to the point, there is no evidence that owners have sold their homes because of discriminatory tax treatment.

Rather than causing sharp fluctuations in tourist flows, taxation should act as a flexible tool capable of regulating tourist pressures by raising prices where the pressure is highest, and lowering prices to lead tourists to less crowded areas.

If all else fails, the state still has land use controls in the form of the police power and the power of eminent domain to limit population density on the coast. Such measures can

vary from common zoning to occupancy limits on buildings, to land taking by the state to limit development.

The limitation on these powers is, of course, political. Most coastal towns do not possess even the most rudimentary zoning, building or subdivision regulations. This is a good indicator of feelings towards such controls by many citizens on the coast. While the state has been given limited powers over land within 250 feet of the coast, this may not be adequate for a comprehensive planning effort. We can only speculate how far the citizens of Maine will trust State government. We would point out, however, that especially in the case of the eastern areas, rational planning will be much less expensive, politically and economically, now than after extensive development has occurred.

SUMMARY: This section has examined some policy areas we feel the state will have to deal with if it selects a non-industrial future for the Coast. The discussion in this section should in no way be construed as policy recommendations. Without exception, the policy areas mentioned are complex legally, economically and administratively. Each will require careful analysis separately and in relation to the other policy areas. Such analysis is far beyond the charge or resources of this report.

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**Heavy Industry or Recreation: Is a Choice Necessary?**

As we stated at the start of this paper, its object is to project the consequences of a state policy which excludes heavy industry from the Maine Coast. The assumption implicit in this assignment is that heavy industry is mutually exclusive with the activities described in this report. While we have tried to fulfill our assignment to the best of our ability, we do not wish anything in this report to be construed as implying that we believe Heavy Industry to be totally incompatible with tourism, second home development, aquaculture or research.

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APPENDIX III

**A Report to the State of Maine**
**Governor's Task Force on**
**Energy, Heavy Industry and the Maine Coast**

**A Canadian Perspective on:**

1. C. E. Veazie, **Heavy Industry on the Maine Coast**, Brunswick, March, 1972 (An Interim Report to the Governor's Task Force on Energy, Heavy Industry, and the Maine Coast);

**and**

2. R. T. Luke, **A Non-Industrial Future for the Maine Coast**, Bath, The Allagash Group, 1972.

by
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May, 1972.

## Introduction and Background

The purpose of this paper is to present our views on the issues raised in two papers sent to us by the State of Maine Public Utilities Commission. One of these papers concerned itself with the pro's and con's of heavy industry on the Maine Coast; the second presented the various arguments concerned with a non-industrial future for the Coast. The former we will refer to as the "light" report; the latter the "heavy" report.

More specifically, we have been asked to present, to the extent possible in a very quick survey such as this, any views or comments based on experience with these issues in the Atlantic Region of Canada. Both Nova Scotia and New Brunswick have now acquired some experience with efforts to develop and manage heavy industry and improved ports. All Provinces have given some thought to the problems and possibilities of tourism and very light industry development.

Given the very brief time available for studying these matters, we could do virtually no new research. We did attempt to pull together the documentation more readily available, and a bibliography of some of the more pertinent material is attached. We also contacted by telephone numerous appropriate people in Nova Scotia and Prince Edward Island, and visited a variety of officials in Fredericton, N.B. For the most part, however, our comments are based almost entirely on our general awareness of some of these issues, and on previous involvement in projects and activities in which these basic policy and planning matters have been important. A series of more general comments is followed by more specific attention to the details of the two reports.

## GENERAL AND PRELIMINARY OBSERVATIONS

It is probably useful to posit a number of very general observations before examining a variety of more specific issues -- the general conditions the particular.

The first is that the broad State/Provincial planning now underway in Maine, perhaps thought rudimentary in Maine, is well in advance of Provincial-level efforts which have been going on in this Region. This is not to say that no work has gone on at the Provincial level; some has, and it will be referred to later. But except for rather rudimentary and generalized policies, there has not been the "macro-level" work to speak of.

Secondly, though naturally our information on Maine is rather meagre, we have the feeling that probably more planning work has been done here at the "micro level" than has been done in Maine. That is to say, there is a small mountain of documentation on municipal, county, port, and other planning units. The planning work done on the Halifax-Dartmouth area, Nova Scotia; on Saint John, New Brunswick; on Moncton, N.B.; and on other larger areas has been quite enormous. Deepwater, ice-free ports are ready-made customers for transhipment, container, power, break-bulk, chemical and other heavy industry studies. But even smaller centres have their Industrial Commissions and related agencies doing studies, either themselves or by consultants; the railway companies have done a range of studies, and various research institutes have conducted any number of village, municipal and county economic and related studies.

Thirdly, perhaps like Maine, nearly the entire focus of development in this Region has been on "jobs at any cost". Unemployment levels are and have been historically half as great again as the national average, and that is very high. More, the rate of increase in employment has been increasingly less than the rate of increase in the labor force -- the disparity between the two rates has been widening. Within that, there are some growth centres which are moving along fairly well with light and fairly heavy industries becoming established eg. Aururo, N.S. But there are other zones where the traditional exploitation industries (logging, pulp, fishing, etc.) are and have been in a rather sick condition -- sawmills and even pulp mills have been closing down, fishermen don't have enough fish, and so on. Many of the newly-created industrial jobs are filled by outsiders who have the skills, an increasing percentage of the unemployed are gradually becoming almost unemployable.

Through various insurance, welfare and related programs, the several levels of government have cushioned the losses and redistributions of income which attend this sort of restructuring of a regional economy. But what also is most important is the need to recognize that if one is putting forward proposals or policies with respect to development, those which receive the quickest and widest audience are those which create jobs, and create them fast. This is the overwhelming political environment in which any "light industry versus heavy industry" discussion is surrounded.

Fourthly, virtually all of the important decisions with respect to the development of these industries and activities are made by the private sector. Other than its role in some of the Parks, the Federal government has very little to say about tourism or industry at the Provincial level. And the Provincial governments have had little influence so far on tourism. Control over industry is another matter; there are mechanisms, and we will discuss some of them later.

Fifthly, and we feel it is of some importance there has been little effort by either the public or the private sector to plan in a coordinated way the joint and mutual development of tourism and recreational facilities for the resident population. Somehow these are rarely associated.

Sixthly, even when studies have been done in this Region, very few appear to read them and fewer still seem interested in carrying through some of the recommendations. There are the usual tourist boards but they have little power. The Provincial departments concerned with tourism, historically, have seemed unable to organize themselved to implement these programs. All programs and plans for balanced development of recreation and tourism, and for industry, required a lot of hard and sustained work by a great number of people; the support of major public and private enterprises; and the cooperation of any governmental and quasi-public agencies and Departments. So far, in this Region, this kind of effort has not been forthcoming.

Seventh, we feel that industry, not tourism, has been more popular with politicians and civil servants in this Region because one can get money out of the Federal Government for investment in manufacturing; there is little or nothing for tourist development. This fact is very important to consideration of "industry versus tourism". For some decades this Region has received a significant share of its income in the form of subsidies and transfer payments from the Canadian Government. Through our Equalization Payments system, nearly half of the Provincial Products (in each of the four Atlantic Provinces) is unearned income. When something goes wrong in the Maritimes, the usual reaction is a request for further government assistance. The Federal Government is considered by many to be the source of all development assistance, and of funds to prop up any group or institution which comes on hard times.

There has been established over recent years a series of institutions to give effect to this special effort to encourage industrial development in the Atlantic Region. The most important of these is DREE, the (federal) Department of Regional Economic Expansion. With grant and low-cost loan programs, DREE is encouraging the establishment of new and expanded plants -- there is rather a "fun" saying down here that "all you need is a bit of working capital and the government will do the rest". In addition to the direct funding of new or expanding enterprises, DREE's offices in the Region give an enormous amount of assistance in the form of feasibility studies, research surveys, market studies, and related efforts. In addition to its regular staff, DREE has maintained a regional advisory group which involves itself in a great number of activities. The current form of this regional advisory group is the Atlantic Development Council; its predecessor, the Atlantic Development Board, was in fact responsible for sponsoring one of the better studies done on tourist development planning for the Region (see reference on last page).

Given the propensity in the Region, then, to look to the Federal government for support for development; and given the fact that such support is geared to industrial development, it is not surprising that most effort heretofore has been directed towards industrial growth. This propensity, this environment, will continue to influence the direction of plans and planning in the future.

Eighth, the "light versus heavy" discussion has been and will continue to be influenced by the simple fact that the "light" requires work on areas far more politically sensitive and difficult than the "heavy". The latter is a matter of larger private companies getting financed and established in zones already demarcated for industrial development. The problem is more one of ensuring that ex-factory costs per unit of output are low enough so that the output is competitive in its markets.

The "light", however, to be handled properly, needs background and detailed work on such sensitive items as land use and land ownership; on the allocation of responsibilities to different levels of government; and on the continuous changing of the allocation and distribution of revenues and expenditures. In Provinces such as these, where rigorous and aggressive administration of such things as land titles has been not only absent but actively avoided, and where even the smallest administrative decision seems to assume major interpersonal and political dimensions, it is small wonder that work on "light" industry development has been minimal.

Ninth, future efforts to develop data and policy on "light" industries, tourism in particular, are also going to be increasingly hung up on the "foreign ownership"-issue. Canada as a whole is going through a serious anti-American-ownership process. In the main this is an expression of feeling against U.S. domination of the manufacturing and natural resource exploitation sectors, and legislation is currently being processed in Parliament which bears on the future "Canadianization" of industrial investment.

With respect to industry, such anti-U.S. sentiment is much less strong in the Atlantic Region. More correctly we suppose, civil service and political leaders have gone on public record as resisting these overly-energetic Canadianization policies, and indeed have continued to support and encourage foreign capital to invest in the Region. Provincial Premiers even go in person to the U.S.A. and to Europe in the search for foreign enterprise.

But land ownership is another matter. The quality of data varies across Canada, but it is clear that Americans over recent years have either purchased or leased on a long-term basis a significant and rapidly growing percentage of the better recreational property in Canada. Waterfront, fishing and hunting rights have been and are particularly popular. There is a very live fear that soon the best areas will have been absorbed by Americans, and in some Provinces such as Ontario and British Columbia, serious studies have been made. In this Region, the major concern has been with ocean front property and with rural property close to the better beaches and resorts. Prince Edward Island has shown particular concern, and New Brunswick is currently attempting to investigate the nationality of ownership of selected types of land.

We are not in a position, nor inclined, to pass judgement on any of this; like most things, the matter has its pro's and its con's. We are pointing out, however, that all current and certainly future deliberations with respect to controlling land use in the more popular and (usually) more densely settled tourist and recreation areas are going to be subject to some kind of "nationality" test at the political level and within the bureaucracies.

We would point out, tenthly, that like parts of Maine, the tourist industry is utterly critical to the economic and financial welfare of a growing number of households in this Region. The several millions of tourists support the economy of Prince Edward Island, and their demands for services in many other selected recreational spots in the Region are increasingly critical to maintaining income and employment in those areas. Future recreation and tourism needs are putting tremendous pressures on public administrations and finances for the provision of even more camping, lodging, park, etc. facilities, and for the provision and supervision of more zoning, pollution, health, etc. regulations. Regardless of what happens to the extractive industries and manufacturing, these demands will continue. What we have, in fact, is not really a "light versus heavy" set of alternatives, but a "light and heavy versus light"; the tourism and recreation will continue, regardless.

Finally, on our list of preliminary generalities, we would like to make the point that the perspective seems to us to be critically relevant to these sorts of deliberations. The representative and normal document dealing with these issues, such as the two provided to us for comment, deals with a time horizon of ten to twenty years. For most planning purposes, for purposes of convincing bureaucracies and legislatures about specific courses of action, for purposes of getting a citizenry to conceptualize a set of specific problems and issues, this time span is perfectly appropriate. Indeed, many decisions have to be seen in the context of the practicabilities of month-to-month, year-to-year and election-to-election trade-offs and real world politics. The "long run" for many decisions is until the next election.

But we should be concerned as well with longer periods. We feel that year-to-year decisions have to be made within the context of five and ten year plans and programmes. But we would urge very strongly that these in turn should be given 50 year and 100 year perspectives. Time after time one hears these days "...if only they had put all heavy industry over there before the War..."; or "if only they had saved some of this beach 50 or 100 years ago for the use of the public..."; or "if only the logging companies didn't have all this land tied up...", a decision probably made three generations earlier. Clearly it is impossible to know in detail what our grandchildren will want in the way of an environment, an economy, and a life-style. Our own grandfathers and great-grandfathers did not predict or take into account our particular wishes or problems.

But it is safe to predict that 100 years from now, all else being equal, our population will be at least double what it is today and probably closer to triple, and our production technology will have reached the point where real family incomes will also be at least double and probably triple. The real question is, what can we do now that will not prejudice that generation's ability to enjoy their environment and, at the same time, a higher standard of living and leisure. We need cleanliness and solitude areas, we need active recreational areas, and we need productive industry as well.

## MORE SPECIFIC COMMENTS ON THE TWO REPORTS

In the light of these rather general statements, discussion can now center more specifically on the two documents we have been asked to review. We will discuss the "heavy" first.

### Heavy Industry on the Maine Coast

We find this an interesting and stimulating report. We have been struck with the high degrees of similarity between development and problems in Maine and in this Region. We of course cannot comment on the details of the statistics provided on the Maine economy and its recent history. The data provided certainly seem consistent with the **Maine Pocket Data Book, 1971** which we have. Indeed, the topicality and detailed coverage in that **Data Book** are much to be envied; there is no equivalent even close to it in this Region.

We thought that the most useful way of handling this review task would be to go through the document from the beginning and comment-at-will, as it were. Our comments generally are of two kinds, one relating to the realism of what is said or to the assumptions behind what is said; and the second relating to an equivalent or similar experience here in the Atlantic Region.

**pp. 34-35** the economic history of Maine is very similar indeed to that of much of this Region. As of this century, however, one of the major problems has been the economic separation of this Region from the rest of Canada. Ontario and parts of Quebec expanded industrially, and this Region's manufacturing sector, once prosperous, declined very quickly. One of the most important legacies of this history, however, that development planning certainly must take into account, is the importance of the "old" family firm, and the heritage of "classes" which seems to have gone with this heritage. Industrial development in the last 50 years has been based almost entirely, until just recently, on extractive industries -- forestry in its many forms, some mining, fishing, and the processing of agricultural products. The big company, the old company, and the traditional way of managing and doing are very deeply embedded in this Region, one of the reasons why new industrial development, new technologies and new entrepreneuring approaches more often than not are made by outsiders, not the local industrial community.

As indicated on **pp. 35-38,** future industrial possibilities to some extent are linked to how new activities are consistent with these historically obtaining patterns. The basic advantages list for Maine is much like the list for here; does the disadvantages list include some of these problems associated with rather traditional type institutions? Certainly a most serious problem is the shortage of the more entrepreneuring and skilled people. For several generations most of the more aggressive and trained Maritimers, apparently as in Maine, have been moving away to elsewhere in Canada and to the U.S.A. Maine may not have "any unique advantage with respect to labor...", but we wonder if in fact it has a disadvantage?

The employment projections for the State (p. 35) are most interesting. We feel that they probably represent rather realistic assumptions with respect to the changing structure and growth of the Maine economy. They are more sophisticated than equivalent data for Provinces in this Region. One would need to know more about the assumptions with respect to capital/output ratios, population growth rates, changing labor force participation rates, etc. But the figures certainly are consistent with past trends.

We might be inclined to question the -52% for agriculture. Our impression is that that sector has already dropped pretty far in the State; if small increases are anticipated in food processing, will the processing be using imported raw material? Certainly in this Region, food processing has been doing fairly well, and it is felt that it will continue to be a satisfactorily growing industry.

With respect to the **kinds** of industries which could be attached to the Maine coast (pp. 5-6), we are certainly in agreement with the list of industries presented (and then discussed more thoroughly). In this Region considerable emphasis has been given as well to the recent (and future) growth of shipyards in Nova Scotia, New Brunswick and Newfoundland (as distinct from boat-building); to heavy water plants in Nova Scotia; to steel in Nova Scotia; and, in New Brunswick, to the development of something called Multiplex in Saint John. DREE has financed the seeding of a Corporation to conduct studies and then to establish a functionally integrated combination of metal-working and electrical industries. It is too soon to say if this effort will succeed, but some plants are already on the ground. This attempted concentration of integrated activity is one offshoot or result of a general policy objective of fostering growth centers, or poles, in the Region. These include Saint John, Moncton, Halifax-Dartmouth and the Straits of Canso-Truro areas. Almost all heavy industry is to be related as well to deepwater, ice-free harbour development. The new Lorneville port development (Saint John) is to feature break-bulk, container and other handling services for general cargo and automobiles, as well as petroleum/tanker/refinery activity. It should also be noted that much of the new activity in the Region's shipyards is connected with the recent offshore oil exploration activity -- the construction of drilling rigs and supply vessels.

On **p. 37** the report makes the point that it is highly unlikely that Portland or other ports will develop as container trans-shipment points due to nearby competing ports. This is probably correct in the short run. But if one looks 25-30 years ahead, it is likely that traffic at these competing ports will have reached something close to capacity levels, if not of the ports themselves, then of the transportation systems servicing them, especially the railways. We wouldn't rule out Portland containerization by the turn of the century. This would be consistent with the use of Portland, in spite of certain problems mentioned in the report, as the site of new oil refining capacity somewhat inland. Our own view, on the basis, granted, of very limited information so far, is that the Portland area should be the focal point for nearly all of the heavy industry contemplated in this report. The discussion of alternate locations (pp. 38-41) is useful, but we think that the ' 'substantial" industrialization contemplated requires concentration in the most economically viable spot; otherwise Maine loses any advantages it may have and it is just not going to attract such industry.

We think it is important to point out also that, in our view, one cannot really take heavy industry to the unemployed in a situation like Maine's. While it perhaps is realistic to consider locating more foot-loose consumer and light industries in areas with high unemployment (such as Washington County), heavy industry must locate where its economies are best. In this Region there has been a movement of people to larger towns and cities from less densely settled areas, and there has not been a shortage of workers for new plants opening up in the cities. In fact, the opposite seems true; it is the new plant in the small town which often experiences difficulties in finding the right kinds of permanent workers.

**Petroleum and Related Industries (pp. 42-51)**

We of course have not gone into the economies of the size of oil refinery which should be established; the presumption is that the 300,000 bpd plant would be more appropriate given current and future demand schedules in the Region, and the fact that, even if work started in 1972 it would be 1976 before it came on stream. It would also take that long to organize and develop any infrastructure needed for such a plant, especially if Long Island had to be developed as the major off-loading facility. We just cannot see such a large refinery being located anywhere except in South Portland.

We find the employment and income impact analysis on **pp. 18-23** generally sound. The report, quite rightly, is cautious in the use of multipliers. Leakages are enormous in Maine, just as in this Region; the 1.8 suggested for Portland (p. 23) is perhaps a bit high. A rather similar exercise conducted recently in this Region produced a multiplier of 1.57. Given the heavy service content of local employment, it would probably be fair to say that every permanent job in the refinery will occassion one more job outside of it in the State economy.

We would just drop a word of caution, however, with respect to the speed with which the local content of the refinery labor force is increased. Particularly if the refiner is a major company, there are going to be a great number of people in the company who wouldn't mind a transfer to the new plant in Maine. Secondly, and more importantly, no oil company is going to entrust millions of dollars worth of equipment to green and unskilled workers. It will be many years before significant numbers of local workers will have the skills and experience in the plant to assume senior and higher-paying jobs. This is balanced off, perhaps, by the consideration that any major company will be looking to the future and probably yet another refinery in 8-10 years time, for which it would need skilled workers -- locals are cheaper in that moving costs are lower. Finally, a new oil refinery, other than in its construction phase, does little if anything to solve the local unemployment problem. Most locally unemployed, by lack of training, skills, motivation and intelligence, are **not** candidates for refinery employment.

We have no comment on the tax benefits of a new refinery. But it is certainly true that local public costs will rise to accommodate the net additions to school populations in the residential areas absorbing the refinery families. Local rates tend to be left the same, and applied to the new facility, usually bringing in considerably more revenue than the refinery population costs the municipality.

The discussion of the impact on fuel and power costs seems reasonable, though it is sometimes the case that an independent retains his lower prices only for those periods which permit his breaking into the market. A most important point is that Maine has numerous plants, especially in textiles and pulp and paper, where even a few dollars saved on fuel and power costs can be most important to the survival of the firm. In this Region it has been found, in the older plants, that fuel and power costs per ton or per dollar of output are significantly higher than the Canadian averages in these industries. As a matter of policy it might be desirable to leave prices to homeowners the same, even if reductions were possible, and encourage significantly reduced rates to marginal mills.

Nor would we put too much dependence upon the presence of a refinery to stimulate throughput in technical schools. The oil companies tend to train their own people.

On the basis of experience so far in this Region, the real benefit of refineries is the constant availability of fuels at prices which do not rise more quickly than average. Maine can use increased refining capacity for a long time. Even using surplus Canadian power, Maine apparently requires enormous increases in energy. It looks as if the real discussion should be whether 1.5 - 2.0 mbd capacity should be built all in one place over 15 years, or spread out in several places.

We find little comment necessary with respect to the environmental aspects of refinery development **(pp. 48-49)** It is perfectly possible, given appropriate State and municipal administrative rules and machinery, to reduce to an absolute minimum the negative environmental influences of a refinery. New plants interfere only marginally with the physical environment, especially if they are all located in areas designated for this purpose, and **only** in those areas. Out of the tens of thousands of square miles available to him, the citizen just avoids the few square miles with chimneys and smells. As one N.B. politician said the other day, in reply to a citizen who complained of a pulp mill smell, "don't knock it; it's the smell of jobs". One gets the impression that, in Maine, people do not trust the ability of their bureaucracies to control and regulate industry? Even land values can be frozen to avoid speculation; this was done at Lorneville (Saint John), for example.

It is just too early to tell if offshore exploration for oil and gas will develop into commercial production. It seems to us, however, that Maine should give very serious thought to how it would react to such a development. The Federal and Provincial Governments here have already conducted studies on the possible economic impact of such developments, **should** they materialize, and how the shipbuilding, manufacturing and service sectors, as well as the labour force, will be affected. What can be guaranteed is that **if** production is commercialized, the Maine coast will swarm with speculators and entrepreneurs, land prices will skyrocket, housing shortages will appear immediately, new and almost uncontrollable housing developments will mushroom, etc. All levels of government have to be ready. We see no reason, either, why Maine's maritime construction sector should not participate in offshore development requirements even if these activities, if they materialize, are offshore N.S. or Newfoundland. Surely Maine has the capacity to bid on supply vessels and tugs?

We agree with the comments on petrochemicals; it is most unlikely that even a 300,000 b.p.d. refinery will induce such an industry. But it depends somewhat on the sweetness and types of crude oil being imported. But at 800,000 - 1,000,000 b.p.d. in, say, three or four refineries, all in the same general location, petrochemicals become realistic. The Maine market at that point might also justify such facilities. Certainly in this Atlantic Region there will be no petrochemical development for a long time, even if petroleum is commercialized offshore.

### Electric Power

There is little we can say on this matter. The provision of power to meet future needs appears relatively easy with the use of atomic plants. Presumably the State will need to add about 1 million kw. every 8 - 10 years? That is about $20 - $30 million per year, a very manageable sum. We would only stress that power development and availability, especially at 9 - 10 mills per kwh, should and can be planned in an integrated fashion with other heavy industry. If the question ever arises - which should come first, the demand for power or the supply of power? -- the answer on the basis of experience, in this Region at least, has been the supply. The N.B. Power Corporation's long run power development plan was well in advance of requirements, but its very presence created a more favorable and attractive environment for industry. There is no such thing as "cheap" power any more. But between atomic energy and adequate supplies of fuel from new refineries, Maine should be able to remain competivite in its power costs.

### Pulp and Paper

We are of two minds with respect to pulp and paper, having just recently completed a rather thorough study of this sector for the Government of this Province. It is pretty clear, however, that within a short span of years a good number of older and less productive pulp and paper mills will fold up. Even if they have aggressive management (not too common), and even if capital cost allowances and other taxation concessions are improved, it is merely a matter of time before such mills will pack it in. Adding heavy investments in anti-pollution systems will be the straw-on-the-camel in many cases, even when such investments are virtually tax-free.

Presumably Maine could do what several of these Provinces are doing; that is, take a good hard look at the economic and financial structure of their pulp and paper industry and then see if new integrated plants can replace, over time, much of the existing plant. Over 15 years, for example, it should be possible to establish three or four quarter-million ton groundwood pulp and paper mills using the most modern technology and relying upon completely integrated activities. This functional integration has been the real reason for success in British Columbia and the south of the U.S.A. Given the development of one or two deepwater ports, the nearness of the industry to the ports, and the improving ability of U.S. paper products to enter the EEC markets, we see no reason why Maine cannot share in these developments. New Brunswick in particular has already set in train the needed studies and plans. Integrated and bulk marketing systems will have to be part of this new look.

### Other Industries

We have already commented on the possibly enhanced role of Maine shipyards with respect to supplying vessels for offshore petroleum activity. But drilling rigs and production platforms are more usually not constructed in shipyards; they are enormous welding jobs requiring flat space on deep water -- bridge construction and steel-handling firms more usually perform this work. This might be worth thinking about.

In addition, it might be advisable for someone to look very carefully at the DISC programme. There may be ways to assist firms to enhance exports, especially to Canada and the EEC. But there is a second aspect of DISC which we have noticed which could have some bearing on the attractability of Maine's ports and harbours. The DISC Statute Legislation is Title V of Public Law 92-178. Section 994(c) of the law, if we interpret it correctly, is in effect a further subsidy for a U.S. DISC shipping on U.S. carriers, up to 50%. This **could** mean the by-passing of Canadian ports, especially with bulk cargos.

**Policy Alternatives**

This final section of the report exhibits, in our view, a great deal of good sense. All of the Atlantic Provinces have adopted industrial zoning policies and have established industrial zones for the location of particular types of industries. Not only must firms agree to establish in these zones, as prescribed, but also the financing agencies, public and private, will not participate unless the company is properly located. This financing is a powerful enforcement weapon. We fully agree that heavy industry should be confined to several coastal areas only; that is happening here as well.

Unfortunately, however, while certain zones have been earmarked for new heavy industry (and light industry), the bulk of the coastal zone has no real control exercised over it. Zoning for heavy industry is but one part of the package, and probably the easiest part. There is no coastal development plan in force in any of the Provinces, though drafts are circulating and other studies are just beginning. What is needed up here, indeed, is an accepted **regional** plan, not just a series of Provincial plans -- they must be coordinated, but it will be a long time yet.

We also agree that all ultimate authority over this plan must be at the State level; otherwise there is chaos. Experience in this Region would indicate, however, that one can perhaps use subsidies rather judiciously to guide development. The report comes out rather strongly against subsidies. We would be more inclined to think hard about them where the benefits of a project clearly exceed the costs, but where the benefits are so diffused that they are non-collectible in the usual manner (through the usual taxes). Or you may want to put a refinery or a mill 150 miles inland. If the benefits exceed the costs, and if a subsidy or a low cost loan of $x million will bring the plant which otherwise would **not** come, then it may be worth it.

Finally, we agree fully with the Port authority concept **(pp. 58-60)**. These are in operation in Halifax/Dartmouth, Saint John, and St. Johns (Nfdl.) and are of tremendous value. The objectives of such an authority 60) are sound, though not easy to achieve. The big advantage Maine has now is that it is almost starting from scratch; in places like Halifaz and Saint John, many of the administrative difficulties arise from the fact that numerous firms have been there for some time, and enforcing new regulations on them is sometimes very difficult without having them close down.

## A NON-INDUSTRIAL FUTURE FOR THE MAINE COAST

The second document sent to us for review attempts to outline the future of the coast without heavy industry, projecting the next 20 years based on tourism, recreation, second home development, fishing and aquaculture, research and educational institutions, and retail and consumer service firms. It concerns itself with a range of activities, in other words, at quite the opposite extreme from the heavy industries already discussed in the first report.

We find ourselves asking about, of course, the future of the in-between, that enormous array of consumer goods, intermediate goods, and light capital goods manufacturing and processing industries. These were alluded to in passing in the report on heavy industry, and some data given on recent and proposed growth rates. Strategically, however, it seems to us, these are the ones -- general manufacturing industries -- over which the planner has most control; they are more footloose; they pick up and absorb many of the registered unemployed; their localization tends to reduce retail prices for consumers; and so on. We would have liked a third document, in other words, on this general manufacturing sector, so that the package could be complete. It is difficult discussing the two extremes in such an unconnected way.

A case can be made, in other words, to the effect that there really is little option with respect to heavy industry -- it will go almost automatically and as a matter of policy in any case to the one or two appointed areas. There **will** be heavy industry, if not now, then a little later. And there **will** be tourism; you cannot legislate people to stay home. They will go to the beaches, lakes, etc. Maine has no option but to have millions of visitors over a few months of the year; there **will** be a tourist industry. This too can be channelled and controlled. But surely what Maine also needs is some package of incentives -- carrots and sticks -- by which to move light industry around the State so as to meet other State goals eg. increase employment in less densely settled areas. You can't move the beach, and you can't really move the refinery or power plant too far away from their more economically optimal locations.

In any case, we agree fully with basic idea no. 4 on **pg. 63** of the report to the effect that heavy industry and the very light industries discussed can indeed live side by side. Our view is that they should.

We cannot really comment on the data used in **pp. 63-66** regarding future trends on the Maine coast, and we centainly appreciate the problems in trying to acquire and use the rather poor data available. We have similar problems in this Region. What has been found here, however, is that when one does start counting, the numbers are always a lot bigger than was imagined. Secondly, at least in this Region, there has been a tendency to underestimate the rate of growth of tourist traffic and the demand for services, park and camping space, etc. We would also comment that, while the idea of an enhanced road network to get more people away from the beaches is a good one, it can also lead to even more pollution and deterioration if it is done in advance of or even simultaneously with the development and administration of effective controls. Maine could find itself in the position of having polluted beaches **and** polluted lakes. Some of this has happened in New Brunswick even with just the opening up of all-weather logging roads.

The consequences of the trends are described on **pp. 67-69**; We find little to disagree with, certainly. We know of no water supply and associated sewage problems in this Region such as those described for Maine. It is quite clear, however, that no overall and definitive plan for land use on the Maine coast should be implemented until much more is known about the physical and technical problems and capacities with respect to water and sewage. Presumably at some point inland water being brought to the coast or even desalinization plants using atomic energy will be in order?

The report makes good sense (p. 68, bottom half) in recognizing that an unregulated and uneducated tourism is probably far more dangerous than heavy industry. It also is correct, in our view, that locals working in a tourist industry tend very much to become a servant class, But if they are not to work in the industry, then they have to have an income from some other occupation; for most, there just isn't any. In this Region we have the phenomenon of people earning tourist income for 4 months, usually in a rather slothful way, then going on unemployment insurance and welfare for eight. They are sitting on some of the best recreational land; they refuse to be organized or even to clean up after themselves. Development of some of the best areas in the Region is in the hands of a multiplicity of less-than-energetic seasonal workers who have little or no interest or capability in improving their longer-run conditions. For these reasons we are in favor of the reports recommendation **(para. 3. p. 71)** for planned clusters with buffer strips between. We also think the several taxation suggestions **(pp. 71-72)** are prefectly appropriate -- we do not have such taxes in this Region.

We also think that second home development areas can be spaced along the coast (and elsewhere) at intervals with the public tourist areas and buffer strips. They can be spaced carefully to avoid the negative effects of mass densities, and at the same time can be put where they will stimulate the local economy most. Second home development planning, however, needs a 30-50 year perspective.

The fishing and aquaculture discussion **(pp. 75-76)** seems quite reasonable. The main point is that the poorest people are hurt when such activities suffer. This emphasises the need for State revenue from the causes of the loss of income -- tourists -- to provide the welfare and even alternative employment, **and** to control the pullution: Clam beds can be revived, can they not? To the best of our knowledge there are no equivalent problem areas in this Region. We have no comment on the "research and educational facilities" section **(p. 15)**. It seems most reasonable.

The coastal retail and service sector is discussed on **pages 79-81** of the report. The main thrust of the discussion concerns the nature of the ownership and control of enterprises in the sector. Change a few of the place names, and these pages are an accurate and well written account of the retail and service sector serving tourists in Canada's Atlantic Region. The same trends and problems are clear. Up here, of course, you must add the further dimension that the Holiday Inns and the MacDonald's are **foreign** enterprises, not even Canadian! We can only agree wholeheartedly with the last paragraph of page 82, and its last sentence in particular - the State must plan and regulate to motivate a more efficient and entrepreneuring **local** private sector to handle this industry.

The final section. **pp. 83-86**, suggests some of the policy measures as to **how** the State may do this. We have already commented on the various measures. None of them are in effect in Atlantic Canada. All are needed in Atlantic Canada, and for the same sets of reasons.

**Concluding Remarks**

1. These are both well thought out and prepared documents.
2. Much more homework has been done in Maine then in Atlantic Canada on studying these development issues.
3. We see the need for recognizing that both heavy **and** light industries **will** exist, and they can be positively controlled, heavy industry particularly.
4. We also see the need to develop equivalent documentation on the manufacturing sector; that sector can meet many of the State's requirements far more effectively than the heavier or the lighter industries
5. It is recommended that the appropriate bodies in the State of Maine, if they have not already done so, obtain a copy of a report done for the Atlantic Development Board in 1969 entitled **Tourism and Recreation in Nova Scotia, New Brunswick and Newfoundland - a program for Balanced Development.** This was done for the Board by Kates, Peat, Marwick and Co. and Lockwood Survey Corporation Ltd., and could perhaps be obtained by writing to Professor W.Y. Smith, Department of Economics, University of New Brunswick, Fredericton. Professor Smith was the Senior official of the ADB at that time. It would serve as an excellent planning model.
6. The real secret of organized tourist and other development, in our view, is making regulations and controls politically acceptable. For this, it must be shown that the recommendations are economically and financially in the interests of those affected, mainly small businessmen and property owners. Atlantic Canada has not found the secret yet.

## APPENDIX IV

### MAINE COASTAL HISTORY OUTLINE *

I. **1600-1760, Land Grants, Early Settlements and Anglo-French Conflicts**

A. The French establish trading posts and missions at St. Croix Island, Castine and Norridgewock

B. English make settlements from Kittery to Pemaquid and at Machias on the coast and inland at the Berwicks, Richmond and Augusta

C. French were largely fur traders and trappers. English settled more permanently– farmed and fished for food and shipped lumber, masts and furs to England

D. French Acadia - Penobscot to St. Croix. Was the object of disputed claims and wars between English and French and Indians from 1626 to 1759

E. Region from Pemaquid to Castine was a sparsely settled buffer zone.

II. **1760-1820, Independence, resettlement and commercial development**

A. After English-French Treaty of 1763, destroyed English settlements were reestablished, and settlers moved inland along rivers and into Penobscot Bay area and eastern Maine coast

B. By 1800, settlers filled in the regions between the lower river valley and settlements stretched along the coast to Calais
   1. Search for more lumber areas inland and sawmills established on river-ocean towns

C. Commercial lumber ports developed at river ports. Three advantages – accessibility to the interior, water power and sea transport. Lumber shipped to East coast cities, Europe and West Indies

D. Grist mills developed for local use

E. Fishing for local consumption purposes carried out along entire coast

F. Shipbuilding industry develops in large, well protected harbors (Kittery, Portland, Bath, Rockland, Belfast, Bangor, Machias)

G. Embargo, War of 1812
   1. Smuggling helps the growth of Eastport and Calais
   2. Embargo curtailed the lumber trade, people turned their attention to farming (Portland, South Portland, Cape Elizabeth)

H. Factors restricting settlement and development from 1760 to 1820
   1. The bad reputation of Maine's climate and soils
   2. Maine's disorganized and violent early history prevented it from establishing an extensive population and market for goods
   3. By being removed from the economic mainstream, Maine was removed from innovative thinking and investment capital

*Prepared by Maine State Planning Office.

**III. 1830-1860, Economic boom—lumber, shipping and ship building**

A. Exhaustion of lumber sources near major eastern U.S. cities

B. Growth of Bangor to become nation's largest lumber port, drawn from the hinterland of the Penobscot Basin

C. Limits of the coastal economic area defined by major ports, important coastal manufacturing centers, towns on navigable rivers
   1. Kittery - ship building port
   2. Biddeford-Saco - textile plants at water power centers
   3. Portland - major commercial area, port, ship building center, state capitol 1820-1831
   4. Brunswick - lumber mills, cotton mills - Bowdoin College
   5. Bath - ship building
   6. Upper Kennebec (Gardiner-Hallowell-Augusta) assorted industries – lumber, textiles, shipping and ice.
   7. Thomaston-Rockland (one town until 1848) Lumber (early) shipping, ship building, lime production, fishing (primarily for local consumption)
   8. Belfast - Lumber (early), finished wood products, ship building
   9. Bangor - Primary lumber port, also ship building
   10. Ellsworth - Water power site for lumber (second only to Bangor during this period
   11. Machias-Machiasport - Lumber production and shipment
   12. Calais - Lumber

D. Abundance of wood and cheap, skilled labor allows Maine to become the world's ship building center during this period.

E. Lumber trade with the south stimulates the growth of the cotton textile industry at water power sites along the western Maine coast

F. World-wide shipping by Maine captains on Maine ships stimulates innovative thinking and creates a cosmopolitan society
   1. Portland becomes a cultural center and rivals Boston economically
   2. Potential for Maine's resources is realized - lime (Rockland), granite (Vinalhaven), ice (Kennebec and Penobscot Rivers), tanning using Maine hemlock

**IV. 1860-1940 Paper, Capitalism, Railroads and Tourists - the industrial economy moves inland**

A. Disruption of shipping caused by the Civil War

B. Decline of ship building due to iron hulls (establishment of Bath Iron Works to avoid obsolescence)

C. Lumber supply nears exhaustion in the accessible woods - the search moves to the mid-west

D. Granite industry dies as building stone is replaced by reinforced concrete

E. Railroads built connecting inland towns with seaports (1830's and 40's)

F. Introduction of paper pulp process (1880's) - necessity for locating paper mills near the wood source and the growth of railroads hastened the decline of shipping and lowered the importance of seaports

G. After WWI, chemical refrigeration had effectively killed the Kennebec and Penobscot ice industries

H. Most paper companies originated outside Maine, and thus much of the profit was taken out of the state.

I. In 1870, Bar Harbor was "discovered" by wealthy families from New York, Philadelphia and Boston

J. After 1930, the textile industry gradually moved operations to the south

K. Portland, Rockland and Eastport took advantage of excellent harbors and rail facilities to develop successful fishing and fish processing industries. Unorganized lobster fishing and clamming become important in most coastal towns

**V. 1940-1970, Present trends**

A. Declining fishing industry due to varying supply of fish, inefficient equipment, restrictive national policies and attitudes, foreign competition, pollution of shellfishing areas and slowly rising profits at a time of rapid inflation

B. Displaced and cheap Maine labor attract marginal, seasonal and somewhat unstable industry

C. Influx of tourists accompanied by rising property taxes - native people are becoming a society of caretakers

D. Shipbuilding and shipping towns are preserved as summer homes and serve as service areas for summer trade

Conclusion — Brief review of how many of Maine's traditional resources have one by one become obsolete and how Maine's distance from markets has accelerated the decline of industry.

A discussion of the recent growth vs no growth controversy and how Maine's remoteness and its lack of development compared with heavy industrialization elsewhere has contributed to an increasing recognition of the State's aesthetic and natural resource and the importance of its preservation. At the same time the increasing size of oil shipping vessels and power plant siting difficulties draws attention to the emergence of other important Maine resources such as its deep water ports, plentiful cooling water and available land - the possibility of a new "industrial revolution" for Maine.

## APPENDIX V

**Separate Statement of Environmental Portection Board Members**

Although we have each, in this report, supported various viewpoints as to the best future courses for heavy industrial development in the Maine coastal zone, we realize that this report does not represent existing Maine law. In the event of applications to the Department of Environmental Portection for permits relating to coastal heavy industry, we feel that we, as members of the Board of Environmental Protection, should reaffirm in this statement our awareness that such applications must be processed under applicable Maine law, whether or not the law conforms to the positions which we may have taken in this report.

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