13099

COASTAL ZONE
INFORMATION CENTER

Coastal Zone
Information
Center

Planning and Developing Small Harbor Areas

Massachusetts Department of Community Affairs

Case Study • Newburyport, Massachusetts
Local Assistance Series 10

Department of Community Affairs.

13099

COASTAL ZONE
INFORMATION CENTER

PLANNING AND DEVELOPING SMALL HARBOR AREAS

CASE STUDY

NEWBURYPORT/SALISBURY, MASSACHUSETTS

THIS REPORT WAS JOINTLY PREPARED BY:

MARTINGALE, INC.
639 MASSACHUSETTS AVENUE, SUITE 204
CAMBRIDGE, MASSACHUSETTS 02139

AND THE

MASSACHUSETTS DEPARTMENT OF COMMUNITY AFFAIRS
OFFICE OF LOCAL ASSISTANCE
1 ASHBURTON PLACE, 16TH FLOOR
BOSTON, MASSACHUSETTS 02108

PROJECT STAFF:

GREGORY F. DOYLE	PROJECT MANAGER, MARTINGALE, INC.
DAVID M. LUCE	SENIOR PLANNER
MADHUKAR A. REGE	PRINCIPAL PLANNER
DORRIT SENIOR	PLANNING SPECIALIST
RICHARD KHAN	GRAPHIC ARTIST
CONSTANTINE YANKOPOULOS	CHIEF PLANNING OFFICER

NOVEMBER, 1977

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413

Property of CSC Library

HE554.A3 M338 1977
517206
MAR 24 1997

The preparation of this report was financed in part through a comprehensive planning grant from the U.S. Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended.

CONTENTS

			Page
CHAPTER I:		INTRODUCTION AND SUMMARY	1
	I.1	Background	1
	1.2	Problem Definition	4
	I.3	Summary of the Study Report	7
CHAPTER II:		MAJOR FINDINGS AND RECOMMENDATIONS	13
CHAPTER III:		CHARACTERISTICS OF SMALL HARBORS	31
	III.1	What is a Harbor?	31
	III.2	Harbor Facilities for Recreational Boating	44
	III.3	Harbor Facilities for Commercial Fishing	59
CHAPTER IV:		COMMERCIAL FISHING IN SMALL HARBORS	63
	IV.1	Historical Background	64
	IV.2	Fishing Vessels and Gear	68
	IV.3	Species Fished	77
	IV.4	Marketing and Fisherman Income	81
	IV.5	Treaties and Quotas	88
CHAPTER V:		SMALL HARBOR DEVELOPMENT POSSIBILITIES	95
	V.1	Harbor Development Interest Groups	95
	V.2	Types of Developments	104
CHAPTER VI:		LOCAL HISTORY	119
CHAPTER VII:		CURRENT STATUS OF THE HARBOR AREA	125
	VII.1	The Harbor Itself	125
	VII.2	Recreational Harbor Users	131
	VII.3	Commercial Fishing	136
	VII.4	The Harbor Communities	139
	VII.5	Economic Impact of the Harbor	147
CHAPTER VIII:		CLAM AND MUSSEL HARVESTING	153

CHAPTER IX:		ASSESSMENT OF LOCAL GOALS AND OBJECTIVES	165
	IX.1	Interviews	165
	IX.2	Surveys	180
	IX.2.1	Survey of Recreational Users	180
	IX.2.2	Survey of Commercial Users	185
CHAPTER X:		DEVELOPMENT OF THE NEWBURYPORT/ SALISBURY HARBOR	195
	X.1	Development Constraints	195
	X.2	General Harbor Developments	213
	X.2.1	Short Term	213
	X.2.2	Long Term	216
	X.3	Commercial Fishing Developments	218
	X.3.1	Short Term	218
	X.3.2	Long Term	223
	X.4	Recreational Harbor Developments	229
	X.4.1	Short Term	229
	X.4.2	Long Term	233
	X.5	Other Harbor Developments	236
	X.5.1	Short Term	236
	X.5.2	Long Term	237
	X.6	Organizational Developments	240
CHAPTER XI:		SMALL HARBOR ADMINISTRATION	243
	XI.1	Background	243
	XI.2	Possible Structures and Powers	247
	XI.3	Community and Harbor Development Authority	255
CHAPTER XII:		REGULATION OF MASSACHUSETTS' HARBORS	263
	XII.1	General	263
	XII.2	State Agencies	264
	XII.2.1	Executive Office of Environmental Affairs	264

XII.2.2	Other State Agencies	276
XII.3	Regional and Local Agencies	277
XII.3.1	Regional	277
XII.3.2	Local Harbor Masters	277
XII.3.3	Shellfish Authorities and Shellfish Wardens	279
XII.3.4	Other Local Agencies	279
XII.3.5	Harbor Authority	280
CHAPTER XIII:	FISHING COOPERATIVES	283
XIII.1	What Is a Fishing Cooperative?	283
XIII.2	Why Form a Fishing Cooperative?	285
XIII.3	Forming a Fishing Cooperative	287
XIII.4	Operating a Fishing Cooperative	294
XIII.5	Financing a Fishing Cooperative	299
	Attachment A: Federal and State Laws Relevant to Fishing Cooperatives	303
XIII.A.1	Federal Fishery Cooperative Regulations	303
XIII.A.2	Massachusetts Fishing Cooperative Laws	310
	Attachment B: Funding and Other Resources	319
XIII.B.1	Federal Programs - National Marine Fisheries Service (NMFS)	319
XIII.B.2	Economic Development Administration (EDA)	323
XIII.B.3	Small Business Administration (SBA)	325
XIII.B.4	Farmers Home Administration (FmHA)	327
XIII.B.5	Farm Credit System	328
XIII.B.6	Department of Housing and Urban Development (HUD)	330

	XIII.B.7	Regional Programs	331
	XIII.B.8	State Programs	332
		Attachment C: Fishing Cooperatives Bibliography	333
CHAPTER XIV		ZONING FOR A HARBOR AREA	335
	XIV. 1	Introduction	335
	XIV. 2	Establishing a Harbor Zoning District	337
	XIV. 2.1	Zoning Map - Chapter 808	337
	XIV. 2.2	Zoning District Boundaries	337
	XIV. 2.3	Uses Within Harbor Zoning Districts	337
	XIV. 2.4	Wetland/Floodplain Overlay District	340
	XIV. 3	Purposes of a Small Harbor District	341
	XIV. 3.1	Purposes from Chapter 808	341
	XIV. 3.2	Type of Regulations from Chapter 808	341
	XIV. 3.3	Purposes for a Harbor Area	342
	XIV. 4	Regulatory Considerations and Land Uses in a Harbor District	343
	XIV. 4.1	Typical Regulations	343
	XIV. 4.2	Typical Uses	343
	XIV. 5	Dealing with a Nonconforming Use, Building, or Structure	356
	XIV. 5.1	Definition	356
	XIV. 5.2	Abandoned or not Used Uses, Buildings and Structures	356
	XIV. 5.3	Alteration, Extension or Changes to a Nonconforming Use, Building or Structure	357
	XIV. 5.4	Bonus Provisions to Control Nonconforming Uses, Buildings or Structure	359

XIV. 6	Regulating the Use of Land in a Small Harbor by Special Permit	359
XIV. 6.1	Definition	359
XIV. 6.2	Special Permit Granting Authority	360
XIV. 6.3	Granting a Special Permit	361
XIV. 6.4	Findings	361
XIV. 6.5	Classes of Special Permits	361
XIV. 7	Variances	377
XIV. 7.1	Definition	377
XIV. 7.2	Variance Granting Authority	377
XIV. 7.3	Variance Granting Procedure	377
XIV. 7.4	Findings	379
XIV. 8	Conclusion	379

Figures

		Page
	Aerial View of Newburyport/Salisbury Harbor	Cover
II.1	Harbors of Massachusetts	14
II.2	Land Utilization - Newburyport/ Salisbury Harbor Area	25
III.1.1	Fixed Pier and Floating Slips	35
III.2.1	Boat Sling	49
IV.2.1	Otter Trawl	72
IV.2.2	Gill Netting	73
IV.2.3	Purse Seine	74
IV.4.1	Monthly Unit Prices and Landings, Fresh Cod in New England	82
IV.4.2	Market News Reports Weekly Summary, Fresh Fish	83
IV.4.3	Real and Projected Earnings and Employment in Forestries and Fisheries, BEA Region 004	87
VII.1.1	Newburyport/Salisbury Harbor	124
VII.4.1	Newburyport Waterfront Renewal Area	143
IX.2.1.1	Recreational Harbor Users Questionnaire	181
X.1.1	Salisbury Waterfront	197
X.1.2	Merrimac Harbor Looking Upriver From Newburyport Clam Flats	201
X.1.3	Newburyport Waterfront From Coast Guard Station to Urban Renewal Area	204
X.1.4	Upper Merrimac Harbor Looking Downriver	207

X.3.1.1	Location of New Ice Facility and Unloading Dock	221
X.3.2.1	Proposed Commercial Fishing Basin	225
XI.3.1	Organization Chart of Suggested Newburyport Community and Harbor Development Authority	256
XII.1	Government Agencies with Regulatory Authority over Harbor Areas	265
XII.2	Massachusetts Harbormaster Communities	281
XIV.2.1	How to Establish a Harbor District	338
XIV.2.2	How to Establish the Wetland/ Floodplain District	339
XIV.6.1	Special Permit Process	362
XIV.6.5	Illustrations of Floor Area Ratio	366
XIV.7.1	Variance Process	378

Tables

		Page
III.1.1	Small Harbor Services	42
IV.4.1	Distribution of Total Stock Averages for 28 N.E. Trawlers	85
IV.5.1	Quotas	89
IX.2.2.1	Commercial Fishing Survey	188
IX.2.2.2	Commercial Fleet Physical Data and Operational Patterns	190
IX.2.2.3	Commercial Fishermen Opinion Survey Results	192
XI.1	Harbor Development Entities - Levels, Structures, and Powers	249
XIII.3.1	Existing Cooperatives	291
XIV. 4.1	Recommended Use Table for a Harbor Zoning District	345
XIV. 6.1	Amenities and Bonuses for Bonus Zoning	368

CHAPTER I: INTRODUCTION AND SUMMARY

I.1 Background

In July of 1976 the Massachusetts Department of Community Affairs invited the communities of the Commonwealth with populations under 50,000 to submit proposals to receive in-depth community planning and management assistance in a number of specific topic areas. One of those study areas was entitled "Planning and Developing Small Harbor Areas" and the preliminary study outline was as follows:

> "This study is designed to assist coastal Communities in the Commonwealth to more effectively plan and develop their limited and vital coastal harbor resources. It is proposed to enable communities to capitalize on the potential for commercial fishing facilities resulting from the enactment of the 200-mile off-shore fishing limit and to improve other economic potentials such as recreation, tourism, and commercial redevelopment and revival.
>
> "This study will concentrate on methods for maximizing the interface between land and water use in and immediately around a typical small harbor and developing a harmonious integration of commercial, recreational, and environmental activities and concerns within the critical resource area.
>
> "Detailed model harbor designs will be prepared indicating physical interrelationships of land and water use, including such items as land and water circulation, piers, dockage facilities, warehousing, channeling, and breakwater construction, etc."

Concurrently, the Department invited interested and qualified consulting firms to submit proposals to conduct one or more of the studies under consideration. For the small harbor study, Newburyport was chosen as the target community and Martingale, Inc. was chosen as the consultant. Gregory F. Doyle, Vice-President of Martingale

was designated as technical director of the study and was closely assisted in the study by John R. Ordway, staff consultant to Martingale. Because of the physical proximity of Salisbury and the common harbor that it shares with Newburyport at the mouth of the Merrimac River, Salisbury was included as part of the study area as well.

The resulting study effort on which this report is based was conducted primarily by the consultants but with extremely close cooperation and assistance from the Office of Local Assistance, the City of Newburyport, and the Town of Salisbury. This assistance was essential to the successful conduct of the study, and the consultants wish to gratefully acknowledge in particular the efforts of Manya Rege, David Luce, Dorrit Senior, and Constantine Yankopoulos, of the Office of Local Assistance; John Leigh, City Planner for the City of Newburyport; and Susan Bayko, Chairperson of the Planning Board of the Town of Salisbury.

Following the selection of the target communities and the consultant, the study team met and mutually determined the outline of the study, its major goals and areas of investigation, and the probable contents of the study report. Briefly, it was determined that the study would concentrate on the development planning of the Newburyport/Salisbury harbor area with special regard for the enhancement of commercial fishing activities but in a manner consistent with parallel interests of the two communities in such areas as recreational uses of the harbor, compatibility with contiguous and adjacent land uses in the communities, the long-range and orderly development of the communities, and the continued economic growth of the two communities. It was agreed

that the study should include historical information on both the local area and the region, especially with regard to fishing and other harbor uses; an inventory of existing facilities, a survey of local harbor and community interests; the formulation of alternative development concepts for the harbor and relevant unit costs and designs; evaluation of these alternatives; and selection of a preferred concept and a recommended course of action. It was further determined that certain hard information and data would be presented in the study report either in toto or by reference. Among such data would be relevant agencies and programs at both State and Federal levels, information sources outside the public domain, and information relevant to the implementation of fishing cooperatives.

As the study effort progressed, an unusual opportunity developed for the immediate implementation of some of the more important recommendations of the study even as this report is being written (July 1977). This development became the cause of no small amount of enthusiasm both among the study team and among the prime subjects of the study, the commercial fishermen of the Newburyport/Salisbury harbor area and has also, in the opinion of the consultant, greatly enhanced the prospects for the subsequent implementation of the more long-term recommendations of this study. Accordingly, these developments, the funding and implementation of a fishing dock and related facilities, will be discussed in some detail in the body of the report. It is clear that these developments will be of immediate benefit to the target communities of this study, and it is hoped that the reporting of these developments will be of benefit to other communities as well in the preparation and pursuit of their own harbor development plans.

I.2 Problem Definition

In principle, the problem facing the consultants and the entire study team was defined by the preliminary study outline issued by the Office of Local Assistance and quoted in Section 1. As in most projects of this sort, however, the true shape of the effort can only emerge as the study team begins to examine in some detail the various topics and interest groups which affect or are affected by the broad concerns expressed by the preliminary study outline.

This was especially true in the instant case because of the fact that the study must essentially serve two separate constituencies with not necessarily coincident goals and objectives. The City of Newburyport and the Town of Salisbury were understandably most interested in a study that would both develop firm recommendations for their harbor development and also serve as the impetus for obtaining Federal and State financial assistance in implementing those recommendations. The Office of Local Assistance, serving the broader constituency of all of the communities of the Commonwealth, was more interested in a study document that could assist all coastal communities, including Newburyport and Salisbury, in planning and developing their own small harbors. The consultants and all members of the study team have attempted to pursue both of these goals concurrently and in a manner that is not detrimental to either. In so doing, the study has in fact expanded somewhat relative to the original outline, and has embraced more topics than originally intended.

Both of the target communities have a common heritage, shared with many other small coastal communities, of both commercial fishing and other uses of the sea and contiguous waterways for transportation, commerce, and recreation. In recent years, the general rise in leisure time, disposable income, and interest in all outdoor recreational activities have caused a substantial growth in recreational boating throughout the Commonwealth and the country. As part of this growth, there has been an increase in the number and capacity of private facilities, marinas and boat clubs that serve the recreational boater as well as the establishment of many publicly funded and operated facilities, from waterfront parks to boat ramps or boat liveries. Newburyport, for example, already has a publicly funded boat ramp at Cashman Park and is in the process of constructing, with State and Federal funds, a bulkheaded waterfront park that will be equipped with slips for visiting boaters. Among other steps being taken by the target communities and many others are the construction or upgrading of sewage treatment plants to improve water quality. The accomplishment of this goal will have many benefits, including an improvement in the water environment for recreational boaters. Both of the target communities are involved in such projects with State and Federal assistance.

Clearly, a lot has been done and is being done for recreational boating interests, yet at the same time, the commercial fishing industry has been stagnating or contracting in the face of massive foreign competition at sea and inadequate facilities in their home ports. The enactment of the Federal 200-Mile Resource Management Zone has addressed the former problem and this study has been directed primarily at the latter. In essence,

the object of the study has been to investigate how the small harbors of the Commonwealth, with Newburyport and Salisbury as the model, can take steps to improve the climate for their local commercial fishermen in a manner consistent with the continued growth in recreational uses of the water and the overall development of the communities at large.

I.3 Summary of the Study Report

In the ensuing chapters of this report, we will present the activities and results of the study effort. Formally, the report is divided into functional chapters, each dealing with one or a few related topics germane to small harbor development in general or to the Newburyport/Salisbury area in particular. In continuing recognition of the dual constituency of this study effort, however, we have also tried to informally organize the chapters into contiguous groupings corresponding to the two constituencies.

This chapter and Chapter II are applicable to both the study area and to the more general concerns of the study. Chapters III, IV, and V deal with broad questions relevant to all of the small harbors of the Commonwealth, indeed to most of the small harbors of New England. In Chapters VI, VII, VIII, IX, and X, we address the specific questions of the history, status, and development potential of Newburyport and Salisbury. In the remaining chapters of the report, we deal with several administrative matters which, while they are of potential interest to any small harbor in Massachusetts, are of immediate and pressing concern to the two communities of the study area.

Chapter II is the bottom line of this report. It presents several factual matters that the consultant feels are important to place the recommendations of the study in proper perspective and to underscore the importance of small harbors to the Commonwealth in

aggregate, even though any particular small harbor may appear insignificant relative to the major parts of Massachusetts. The recommendations of the study are also presented in this chapter. It is nearly impossible to make specific recommendations with broad applicability to a large number of harbors, so the majority of recommendations deal with the study area.

Chapter III examines the fundamental characteristics and needs and functions of small harbors in general. Anticipating the division of interest among harbor users that will recur throughout the study, the facility needs of small harbors are examined in detail from the two points of view of recreational users and the commercial fishing fleet.

Commercial fishing has long been recognized as an important industry in Massachusetts, but most people tend to associate it with Boston, Gloucester, and New Bedford. Chapter IV reviews commercial fishing in the small harbors of Massachusetts and highlights many of the problems peculiar to small boat fishing as well as some of the advantages. Additionally, some general fishing background, equally applicable to small and large boats, is presented for the benefit of readers who may not be closely acquainted with this facet of Massachusetts life.

Chapter V addresses the development of small harbors in general without being limited to the specific circumstances that obtain in Newburyport and Salisbury. It begins by

discussing in some detail the many groups in a small community that will have an interest in the nature and extent of harbor development. Many of these groups may have strongly divergent or conflicting interests which could significantly affect or limit harbor development. With these interest groups and possible conflicts thus identified, Chapter V then goes on to present and discuss the major generic types of harbor developments that a small community may wish to consider.

Chapter VI is the first chapter that deals directly and specifically with the study area. It is a brief chapter that sketches the history of the study area, especially as it relates to the sea and commercial fishing, from pre-revolutionary times to the present. This history makes clear that the nautical traditions of Newburyport and Salisbury are very strong traditions and that any redevelopment of the Merrimac harbor, no matter how ambitious, can only be a partial return to the busy commercial harbor of a century-and-a-half ago.

Chapter VII reviews in some detail the current status of the harbor and its users as well as the communities it serves. In effect, this chapter presents the physical and institutional baseline as a standard against which any possible developments must be measured. It also deals with the economic value of the harbor to the adjacent communities and reveals that economic impact to be quite substantial.

Soft shell clam harvesting takes place in many coastal

communities of Massachusetts and could take place in many more were it not for pollution problems. Because of this, the discussion of Chapter VIII might well have been grouped with the more general chapters III, IV, and V. Instead it has been placed here mainly because of the enormous economic potential of the clam flats of Newburyport and Salisbury. The chapter estimates that potential but, more importantly it attempts to deal objectively with the environmental issues affecting clam harvesting in Massachusetts and the study area in particular.

An important and essential part of this study, or of any effort aimed at significant development in a small community, is the assessment of local needs and wants. Chapter IX discusses in some detail the mechanisms used in the instant case to assess local goals and objectives and the resulting conclusions. Basically two separate approaches were used - the first was a series of extensive but purposely informal interviews with the main interest groups. This was followed by relatively more formal surveys and questionnaires aimed at gathering more quantitative data from the main harbor users.

Chapter X presents the specific recommendations of the study team for the development of the Newburyport/Salisbury harbor. The recommendations are quite specific and are grouped in five general areas, one of which deals only with harbor administration. In general, the development recommendations in each area are separated into short-

term recommendations and long term recommendations. It would be equally appropriate to consider short term developments as those with only modest capital needs and capable of accomplishment with little or no non-local funding. The long term improvements are more ambitious and will almost certainly require State or Federal funding assistance for their implementation.

Chapter XI follows logically on the brief organizational recommendations of Chapter X and deals in much greater detail with the entire local government structure that impacts harbor development. Chapter XI concludes by recommending a re-organization of City government in Newburyport centered on a new body, the Community and Harbor Development Authority. Though the content of Chapter XI is specific to Newburyport, the arguments and concepts it presents will be of interest to most other harbor communities as well.

Chapter XII discusses the regulatory framework within which Massachusetts harbors currently operate and exist. A single harbor may fall under a very large number of regulatory jurisdictions at all their levels of government, and Chapter XII attempts to sort these out in a coherent manner.

The fishing fleets of small harbors are themselves small in several ways - number of boats, size of boats, catch volume per boat, and number of crew per boat. For all of these reasons, the boats and fleets of small

harbors tend to be at the mercy of much larger market entities and unable to deal with the market in a truly competitive manner. Fishing cooperatives offer the fishermen an opportunity to speak and act as a much larger market entity and consequently to deal with the market much more aggressively. Chapter XIII presents the whys and hows of forming and operating a fishing cooperative and reviews some of the practical considerations that existing cooperatives have found to be important to their success. Chapter XIII also presents the applicable Federal and State legislation as a preliminary guide to the legal aspects of a cooperative.

CHAPTER II: MAJOR FINDINGS AND RECOMMENDATIONS

The coastline of Massachusetts is over 1200 miles long and is one of the largest of the lower 48 states. There are nearly 90 communties on or near the coast and over 60 of them have identifiable ports or harbors (See Figure II.1). The Massachusetts CZM Program (1) defines a port as having a navigable channel of 20 feet or more; adjacent land zoned for marine or industrial use; road and rail links; land separated from residential and commercial uses; and several other attributes. Centers of marine activity without one or more of these characteristics are called (by CZM) harbors, and clearly this latter definition encompasses nearly all of the centers of marine activity of the Massachusetts coast, with the notable exceptions of Boston, Gloucester, and New Bedford. For our purposes, a small harbor is one which serves primarily recreational boats, ferries, party boats, charter boats, excursion boats, and liveries. Small harbors support little or no waterborne commerce, but most harbors have at least some fishing activity.

Small harbor commercial fishing activities in Massachusetts have had a low profile and relatively poor access to public resources and assistance on two levels. Locally, small harbor commercial fishing is viewed as a secondary function of the harbor and is frequently overlooked in harbor development activities in favor of the more visible recreational and aesthetic aspects of the harbor. On a state or regional level, any one small

(1) Massachusetts Coastal Zone Management Program, Massachusetts Executive Office of Environmental Affairs, July, 1977.

FIGURE II.1
HARBORS OF MASSACHUSETTS

Sources:

1) Commonwealth of Mass. Executive Office of Environmental Affairs. Mass. Coastal Zone Management Plan. Mass. Coastal Regions and an Atlas of Resources. Volume II of 2. June 1, 1977.

2) U.S. Army Corps of Engineers. New England Division. Project Maps. Volume 2 of 3: Rivers and Harbors, Mass. Revised to 30 September, 1976. Waltham, Mass.: The Corps, 1976.

3) U.S. Army Corps of Engineers. New England Division. Water Resources Development by the U.S. Army Corps of Engineers in Mass. Waltham, Mass.: The Corps, 1975.

4) Waterway Guide: The Yachtsman's Bible Northern Edition. Volume 30, Number 3. Marine Annuals, Inc. Annapolis, Md. 1977.

harbor is accurately viewed as insignificant, in terms of commercial fishing, when compared to Boston or Gloucester. It is a paradox, however, that commercial fishing activities may be one of the most economically important industries in a small harbor community. Statewide, the small harbors of Massachusetts, taken in aggregate, may equal or exceed the fish landings of Boston or New Bedford. We have to say "may" because, with the exception of this study, we are unaware of any systematic attempt to quantify the economic impact of a small harbor. Hopefully, this study will serve to increase the visibility of small harbors and increase the interest in them by planners and funding agencies at both State and Federal levels.

Small harbors should have a variety of goods and services to adequately serve the recreational boating public, varying from the obvious launch/haulout facilities, moorings, fuel, ice, and marine hardware to the less obvious and less essential shoreside power, hull repair capability, or shoreside hotels or motels. Not all small harbors have or should have all of the services shown in Table III.1.1, but most harbors have the majority of these services to some degree. As that same table shows, the number of additional services required to support a small harbor commercial fleet is quite small and many of those additional services can be, and are, jury-rigged in one way or another. The most important of these additional services are diesel fuel, large quantities of broken ice, a dedicated unloading dock with a weighing and sorting area, cold storage, trucking, and some mechanism for selling the catch. Strictly speaking,

the Newburyport/Salisbury harbor offers only one of these supplementary services, diesel fuel, yet it supports a vigorous, though struggling, commercial fishing industry.

The fishing industry of New England has its beginnings in the earliest days of European colonization and has been an important economic force throughout the history of Massachusetts. Recently, however, the industry as a whole has been stagnant or declining in the face of intense foreign competition for diminishing stocks and the fleet has continued to grow chronologically older and technologically obsolescent. Nonetheless, it remains an important industry to Massachusetts. Fishermen operating in the larger, newer boats out of the major ports of Massachusetts tend to stay in the groundfishery and to fish primarily by means of the otter trawl, though not necessarily exclusively. Smaller boats from the small harbor fleets, on the other hand, are more likely to change species and method several times during the course of the year. Methods used include digging and dredging, traps, hook and line, harpoons, otter trawl, gill net, and purse seine. The small harbor fleet consists generally of boats less than 70 feet in length with the 25-40 foot range predominating. The fleet fishes for a large variety of species, many of them quite unfamiliar to New England consumers, but the bulk of the effort is devoted to the familiar and highly valued groundfish and shellfish.

There are many problems faced by the New England fishermen, both small boats and large, but one that seems to be among the most troublesome is the wide variations

in ex-vessel prices on a daily as well as seasonal basis. Small harbor fishermen have the potential to take advantage of this price fluctuation by either holding their catch until price improves or shipping it to alternative, more distant markets, but in most cases they lack the facilities or institutional means to do this. (The larger boats are at a relative disadvantage to the small boats in this regard since they work longer trips and consequently return to port with fish that is considerably less fresh than fish from a small boat day trip. A large boat that tries to withold its catch because of low price runs the risk of quality deterioration or outright spoilage.)

The U.S. has been a party to a large number of international treaties or agreements relevant to commercial fishing and stock conservation, but most of these were abrogated with the passage of the 200 Mile Resource Management Act. Nonetheless, commercial fishermen remain constrained by several domestic quotas as well as some international agreements that were not affected by the 200 mile limit. Many of these quotas are not effectively managed in the best economic interest of the fishermen or of the state or nation. It is recommended that the appropriate agencies at both levels of government analyze the economic implications of quotas, whether domestically or internationally derived, and the associated quota management systems.

Any small harbor development plan will impact a number of different interest groups within the community. These groups are likely to be more visible and contentious than the same groups might be in a larger

port city, and the nature of small community government is likely to bring them in fairly close contact with community leaders. Recognizing this, it would be advisable for local officials to review each proposed development at its earliest stages for its impacts on the various pressure groups and to search for ways to avoid conflicts among them. Commercial fishermen have a direct economic interest in many harbor plans and will wish to be heard. Shellfish harvesters also have a direct economic interest, particularly in any plans that affect water quality or that might otherwise impact the intertidal flats in the harbor. Party and charter boat operators share many of the concerns of commercial fishermen but, on balance, their interests will usually be more closely allied with sports or recreational fishermen. Marinas have a very strong interest in harbor developments, particularly those that involve public funding and/or operation of facilities that are essentially in competition with the private section marinas. There are also many other water-related businesses that operate on or near the waterfront, bait and tackle shops are one example, but their interest is likely to be more peripheral than marinas. Almost any development helps them, and the probability of competition from the public section is almost nil.

Recreational fishermen share many interests with commercial fishermen and, with all boat owners, tend to be in conflict with marina operators on such matters as public funding of waterfront facilities. The reason is

the purely economic one that boat owners would like to see slip and ramp fees driven down and marina operators would like them to stay up. Other recreational boaters share this concern and additionally are usually more concerned with harbor aesthetics than a fisherman might be. Sailors of course are especially interested in channel conditions because of their keels which usually cause their boats to have the deepest navigational draft of any boats using a small harbor. Waterfront restaurants and bars are mainly interested in harbor atmosphere so any increase in harbor use is good for them, provided it does not place aesthetically displeasing activities, such as commercial fishing, too close. Many other non-marine users of waterfront land tend to be relatively indifferent to harbor development as long as their own use and ownership are not threatened. In this regard, any hint of eminent domain would be negatively viewed while developments that enhance the value of dormant land would be welcomed. Businesses that are separated from the waterfront will tend to favor most waterfront developments in the belief that any development that increases local commerce is good. The only proviso would be that local public funding should be limited in order to avoid any significant rise in property taxes.

Community interests at present seem to be heavily influenced by the desire for conservation of waterfront land for public use and access and preservation of the environment. Waterfront developments of the type being discussed in this report, however, are likely to win easier

public acceptance because they are in essence a restoration of unused waterfront to historical uses.

There are many generic types of developments that could be used to improve a small harbor, and the funding and initiative for them may be entirely private, entirely public, or a combination of the two. Specific developments will of course depend on the problems and resources of the harbor in question. Perhaps the most desirable types of developments to most small harbor communities involve the harbor entrance and the navigation or channel. These desired developments range from channel-maintenance dredging or channel marking to very ambitous constructions of jetties or other structures for major harbor entrance improvements, but all require funding and implementation by the Corps of Engineers. Basin improvements are usually undertaken by public agencies, though not exclusively or necessarily by the Corps of Engineers. Dredging, perimeter stabilization, and wave attenuators are the usual types of basin improvements, but the construction of load bearing bulkheads or seawalls can also be viewed as a basin improvement.

Bridges are not harbor improvements per se but they can and do place direct limitations on harbor use and thus should be considered in the same context as other harbor developments. Protection from moving ice is an extremely important improvement for a small harbor in Massachusetts to undertake, to assist its local commercial fishing fleet. Winter fishing is vitally important to the economic base of a small fishing fleet but it is severely limited if the home port is subject to moving ice. Docks and floats are usually combined with some

other form of development, ice protection for example, and may be in either the public or private sector. Construction method and configuration will depend heavily on local conditions as well as the nature of any contemporary developments.

One of the earliest references to fishing in the Merrimac River occured in 1634, and the local industry has existed to one degree or another ever since. The offshore fleet probably peaked about 200 years later when over 1000 men worked nearly 150 boats. Today's fleet is less than 50 boats and direct employment in fishing is less than 150. Newburyport has also been a major center of waterborne commerce and shipbuilding in the past, but both of these industries died in the early part of this century and revival of either is highly unlikely. Nonetheless, the area adjacent to the waterfront and part of the waterfront itself has undergone a massive and commercially and architecturally successful renewal and restoration. This restoration area would be enhanced and complemented by a revival of the rest of the waterfront with commercial fishing as a focus.

Presently, the harbor is viewed by the Corps of Engineers as primarily a recreational harbor and in principle the maintained channel depth is only nine feet. The actual condition of the channel is not quite as good as that would imply and shoaling and shifting are a problem. The weather in the area can be exceptionally severe in winter and the harbor entrance can become nearly impassable under certain conditions. In summer, the harbor

provides a full range of services for recreational harbor users as well as many of the services needed by commercial users year round, the notable exceptions being a dedicated unloading dock and ice-protected slips for deep winter operations. The harbor is heavily polluted so the enormous potential for shellfish harvesting is unfulfilled, but current plans call for new sewage treatment facilities in both Newburyport and Salisbury.

Even without the potential contribution of shellfish to the overall economic impact of the harbor, its economic importance to the two communities is still substantial. Considering only first level effects, we estimate that the local groundfishing effort results in gross landings in excess of $1.25 million annual value; other fisheries land fish worth over $800,000; and party and charter boats are estimated to collect nearly $500,000 per year. The value of the recreational boating and sport fishery is more difficult to estimate but we place it, very conservatively, at well in excess of $500,000 per year. With other minor contributions and an allowance for soft shell clams in the near future, we estimate the total economic activity due to the harbor to be at least $3.5 to $4 million per year in first level effects only.

The clam flats of Newburyport and Salisbury have an enormous potential for economic benefit to the two communities but the current pollution due to sewage discharges on both sides prevents that potential from being realized. The only cure for the situation is improved sewage treatment and fortunately that will

soon be provided in both communities. The previous estimate of economic activity due to the harbor included a potential $1 to $1.25 million from shellfish harvesting as a lower bound. If the historical high yields for the local clam flats are reached, and indications are that that may be possible, then the actual value of shellfish could be in excess of $3 million as an upper bound.

The review of local concerns showed an encouraging lack of potential conflict among various harbor interest groups. Commercial fishermen were mainly interested in a dedicated unloading dock and ice-free slips for winter fishing along with a local supply of broken fish ice. They also expressed a strong concern for improvements to the harbor entrance and the channel, a concern that was shared to a greater or lesser degree by all harbor users. Fishermen also expressed an interest in an improved fish marketing and storage process to replace the present system of ad hoc arrangements for selling their catch and the lack of local cold storage of any significance.

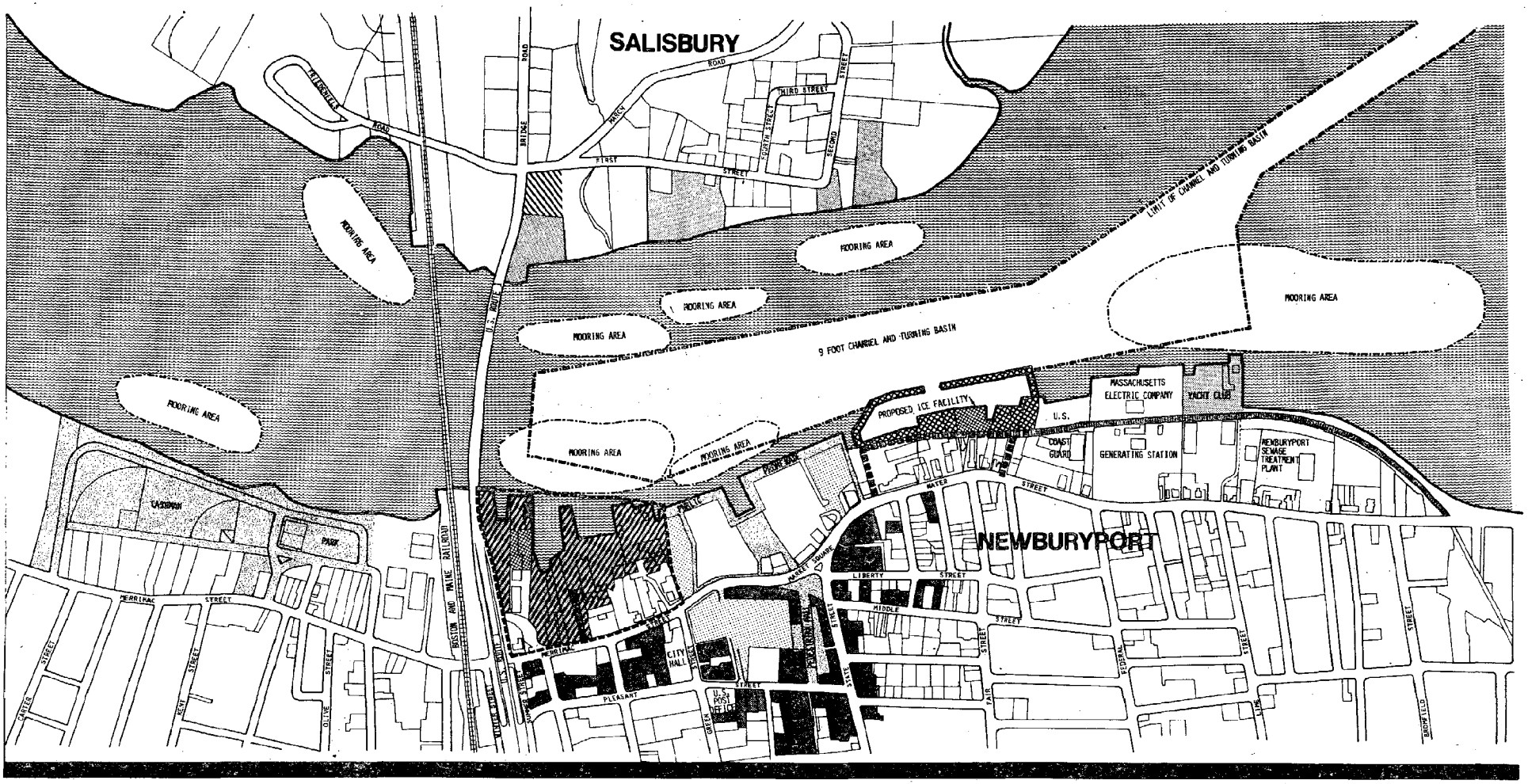
Marina operators would like to see the harbor improved and its use generally increased, but their main concern seems to be that the public agencies will provide more services that have been traditionally in the private sector. The existing public boat ramp and the seawall and slips that are under construction give rise to much of this concern. Public interest in harbor development was not well defined nor especially strong. Most developments would probably receive rather passive public sup-

port provided they do not raise any strong questions of environment or public access to the waterfront. Public awareness of commercial fishing and its economic impact was low, yet there still seemed to be acceptance that "something should be done" for the commercial fishermen. We believe this passive support of fishermen would increase as the true impact of the industry becomes known.

Figure II.2 shows the current land utilization in the Newburyport/Salisbury harbor as well as the two major recommendations for development in the area closest to downtown Newburyport. It should be pointed out that the land use designations of the waterfront lands should not be interpreted too closely, especially in the case of the distinction between recreational uses and commercial uses. As we will point out repeatedly in the following chapters, there are many areas of the harbor that are primarily recreational but serve the commercial fleet as well. Figure II.2 shows most of the harbor that is considered as likely to be developed in the foreseeable future. Most other shoreside lands were removed from further consideration for development during a parcel-by-parcel review of both sides of the river.

Specific recommendations for development of the Newburyport/Salisbury harbor are as follows:

a) <u>Channel and Entrance Developments</u>
   1. The mouth of the river should be redredged within two years.
   2. The ends of the jetties should be marked, preferably with lights, but at least with day beacons and radar reflectors.



LAND UTILIZATION

Newburyport Salisbury Harbor Area

0 125 250 500 1000 SCALE IN FEET

N

MARINE USES

- RECREATION
  yacht clubs, marinas, sport fishing and boating facilities
- RECREATION / COMMERCIAL
  marine supplies, construction, repair and related services
- COMMERCIAL
  commercial fishing or sea-food processing
- PUBLIC SPACE

HARBOR SUPPORTIVE USES

- PUBLIC PARKING
- SHOPPING AND SERVICES

PROPOSED DEVELOPMENTS

- REVITALIZATION AREA
- COMMERCIAL FISHING
- ACCESS ROAD
- PUBLIC RIGHT OF WAY

3. The break in the north jetty should be similarly marked.
4. The main channel should be dredged as soon as possible and placed on a more regular maintenance schedule.
5. An additional channel marker is needed between Red Buoys No. 12 and 12A.
6. More or all of the present buoys should be lighted for night navigation in summer.
7. All buoy lights should be maintained through the winter either by placing larger buoys or protecting the lights from ice damage by a lexan dome.
8. The north jetty end should be repaired and the entire jetty built up to a greater height.
9. Depending on model test results, capital dredging of the inner channel should be considered to reduce shoaling.
10. Consideration should be given to removal of the worst navigational hazards in the harbor: Half-Tide Rocks, the abandoned jetty near Black Rock Creek; and the ruins of the South Pier.
11. The North Pier (also known as the Icebreaker) should be repaired.
12. In the very long term, a new channel should be dredged downriver of the American Yacht Club, if the model tests indicate it to be hydraulically feasible.

b) Commercial Fishing Development

1. An unloading dock dedicated to commercial fishing should be provided. (This is being done as discussed in Chapter X).
2. A local supply of commercial quantities of broken ice should be provided. (Again see Chapter X).
3. A cold storage capability should be provided as part of the unloading facility. (This also is being done as discussed in Chapter X).
4. A new dock should be built to provide ice-protected mooring for the local commercial fleet. (See Figure X.3.2.1).
5. The entire fishing operation should be located adjacent to the new waterfront park as shown in Figure II.2.
6. The pier forming the fishing basin should be used for commercial fishing support facilities on its downriver arm but as an extension of the business/recreation/tourist activities of the renewal area on its upriver arm.

c) Recreational Developments

1. Public agencies should encourage the growth and refurbishment of all marinas and clubs in the area.
2. Both communities should encourage or require provision of sanitary pumpout facilities at any new or expanded marina facilities.
3. Newburyport should prohibit or severly restrict new private or marina moorings in front of the

new seawall and waterfront park.

4. Harbormasters of both communites should be empowered and instructed to prepare and enforce overall mooring plans to better utilize available mooring space and avoid channel encroachment.
5. Consideration should be given to a public pilot project to test the feasibility of a mooring raft as a partial solution to the mooring space problem.
6. Newburyport should encourage the several non-water uses of waterfront land between Joppa Flats and the Route 1 bridge to relocate away from the waterfront over the long term.
7. To assure the highest and best re-use of these lands, the City should adopt a new zoning law including a harbor zone.
8. The City should request the Corps of Engineers to begin preliminary studies of a long term plan to place a major new recreational boating complex downriver of the sewage treatment plant. Such a facility could ultimately accomodate some 600 boats on 10 acres of land and 50 acres of basin.

d) <u>Other Harbor Developments</u>

1. In the short term, the City should encourage and assist the businesses between the new waterfront park and the Route 1 bridge in a cooperative cleanup effort.

2. Within this waterfront revitalization area, the City should assure, via formal easements or some other means, that pedestrian access along the waterfront is provided in order to make the entire downtown and waterfront accessible to both locals and tourists.
3. Additional floats should be obtained for the new bulkhead in order to increase its berthing capacity.
4. Electricity and potable water services should be provided at the public slips.
5. City-owned guest moorings should be placed in front of the new bulkhead.
6. Part of the new bulkhead should be reserved for display of, but not access to, the charter and party boats.
7. Display moorings or slips should be provided by each boat owner at his own expense.
8. All facilities associated with the new bulkhead must be policed and maintained to assure that their primary intent of attracting more tourist business to the area is met.

e) Organizational Developments

1. The harbormaster position in Newburyport should become a full time position.
2. Consideration should be given to a single harbormaster with full authority in both communities.
3. Salary and expenses of the harbormaster should be paid by harbor-derived revenues such as slip and mooring fees and lease payments on the ice facility.

4. Newburyport should create a Community and Harbor Development Authority to administer its harbor. (See Chapter XI for a full discussion of this recommendation.)
5. The Newburyport Community and Harbor Development Authority should have representatives from Salisbury on its Advisory Board.

While the above are the major findings and recommendations, they are by no means all of the conclusions of this study. We strongly recommend that interested readers use Section I.3 as a guide to those parts of the report that are most germane to their interests for further details on these major conclusions.

CHAPTER III: CHARACTERISTICS OF SMALL HARBORS

III. 1 What is a Harbor?

At first glance, the title of this section may seem unnecessarily naive, yet a rational approach to harbor development planning requires a rather detailed answer to that question to assure that the many functions and needs of a small harbor are adequately met. In simplest terms, a harbor is a body of water where boats may be conveniently and safely kept when not navigating or otherwise in use. Under this broad description of a harbor are many variations and more specific descriptions. The first distinction we must make is between the small harbors of this study and major ports such as Boston or Gloucester. For our purposes, a small harbor serves primarily recreational boaters, ferries, party boats, charter boats, excursion boats, and liveries, but little or no waterborne commerce.

The first function of a harbor of course is safety; and if one were siting and designing a new harbor, site selection would involve considerations of local weather, wind and tide conditions, currents, topology, and related topics to assure that the chosen site would meet this prime function adequately and at reasonable cost. Realistically, however, both the target communities and the other potential users of this study already have existing harbors whose sites were selected decades or even centuries ago. In fact, the historical pattern of Massachusetts coastal development has been one of recognizing natural harbors and then establishing communities adjacent to them. Because of this, the site selection criteria for harbor expansion and development are much more heavily based on environmental considerations or contiguous land uses than on the more gross physical site variables, though wind, tide, current, and depth questions remain important nonetheless.

Small harbors are usually located in naturally protected areas such as bays, inlets, or river mouths though some may be partially or completely manmade by means of breakwaters or jetties. In rare instances a small craft harbor may be located on an exposed shoreline with little or no protection, but weather conditions in New England essentially preclude this type of open roadstead harbor here. Each harbor is of course different, but they can be placed in broad categories by means of their most significant characteristics as follows:

a) Current

Bays and inlets generally, though not always, have little or no current while rivers and river mouths usually show currents that range from insignificant to three to four knots. Tidal river mouths experience reversing currents, downriver on the ebb and upriver on the flood. A current of any magnitude can have a substantial effect on harbor characteristics and expansion possibilities. In a swift current harbor, for example, slips and other facilities must usually be oriented parallel to the current flow since it is extremely difficult to maneuver a boat at berthing speeds with a swift current broadside. This limits the options for slip arrangements and substantially increases marina investment costs since floating slips must be more securely anchored and cannot extend as far from shore as they could in a slow current or no current situation. In terms of boat handling, both weekend boaters and professionals can gain substantial advantage from a swift current in approaching and leaving a marginal berth because the current will provide a water velocity for steerage while the

boat has a near zero velocity relative to the pier or mooring float. On the other hand, a swift current makes it more difficult to tie up to an offshore mooring or to approach or leave non-marginal slips. (A marginal slip is one located parallel to the current flow and at the outer edge of a float or pier. A non-marginal slip is one that is either non-parallel to current flow or located on the shore side of a float or pier.)

Current also affects maneuvering near obstacles such as bridge abutments, channel markers, rocks, or shoals and can have a substantial effect on channel depth maintenance and the placement of new fixed structures. A swiftly flowing river can assist channel maintenance by continual scouring of the channel while more stationary harbor waters may mean that continual dredging is needed to prevent channel blockage by siltation. New fixed structures will usually have little effect on shoaling patterns in bays or inlets with low currents and siltation rates while the same structure could cause major changes in siltation patterns in a swiftly flowing river.

Current is also a major consideration in the placement of facilities or industries that discharge effluent into harbor waters and this would include marinas, fishing docks, and boat clubs. Though new anti-pollution regulations seek to reduce effluent that is polluting, nonetheless there will continue to be discharges for some time to come due to grandfather clauses, accidents, or violations. Marinas and boat clubs can produce both raw sewage and petroleum products spills and discharges that are

a considerably greater problem in areas with low water flow and limited cleaning action. Fishing docks, even those catering mainly to recreational fishermen, can also cause considerable discharge of dead fish or fish parts as people clean and sort the days catch at dockside.

The Merrimac River harbor serving Newburyport and Salisbury has an extremely swift current of up to three knots on the flood tide and nearly four knots on the ebb. This current has limited marina development as noted above and continues to limit the potential for further development in both the private and public sector. As we shall see, the current and ice combine to effectively shut down the harbor to commercial fishing during the prime fishing months in winter.

b) Tidal Range

Tidal range has a number of effects on past and future development possibilities in a harbor, but the most important is probably in the design of shoreside facilities. In harbors where the tidal range is slight, of the order of one to three feet, piers and docks can be fixed structures built on pilings, if necessary, or simply treated timbers standing in the river or sea bottom. In harbors with more severe tidal ranges, slips are usually on floats so that boats are accessible at all tides. The floats may be held in position either by chains attached to shoreside piles or even trees or the floats may be attached to piles at their corners and ride up and down with the tide by means of rings or rollers called traveling irons. Access from the

shore or a fixed level pier to the floating slips is by means of a hinged ramp that rides on rollers at its lower end. Floating slips are not nearly as strong as fixed piers, in fact they must be hinged or in some other way articulated at several points to allow for tide and wave movements, and they are thus limited in the physical size that can be reasonably and economically reached, especially in harbors where high tidal range and swift current both obtain. In the Newburyport/Salisbury harbor, for example, marinas are generally limited to two or three rows of floats, or four to six rows of slips, all arranged parallel to current flow.

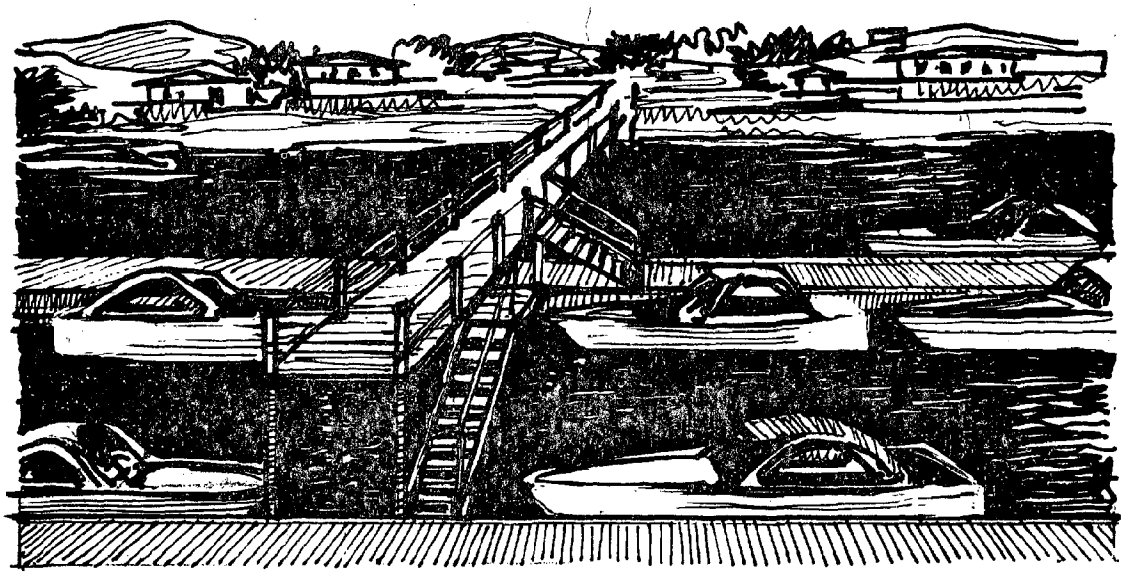


FIGURE III.1.1 FIXED PIER AND FLOATING SLIPS

A high tidal range combined with a very gradual slope of the river or sea bottom can also increase marina investment costs in another substantial way. The parking area and buildings associated with the marina must obviously be located well above the high tide mark, yet the floats must be located in water deep enough for the boats serviced, even at low low tide. The result is a very long pier or trestle connecting the two, and this is both expensive to build and maintain and causes a good deal of inconvenience for boaters and marina personnel alike. Likewise, a high tidal range coupled with shallow bottom slope requires excessively long marine railways or support piers for powered boat slings or similar devices for launching or hauling large boats. Boat ramps for launching of trailered boats must also be excessively long in such situations.

In the Merrimac River, the average tidal range is 7.8 feet and the bottom slopes rather sharply on the Newburyport side but has a very gradual slope on the Salisbury side. The natural channel lies closest to the Newburyport side in the area of the majority of waterfront activity but is closer to the Salisbury side further downriver where the river widens out at its mouth. The Army Corps of Engineers in principle maintains a channel of 200 foot width in the downriver part of the harbor and 400 feet, with a turning basin, near the center of water activity.

c) Ice

In the New England climate ice is an important factor to any harbor and must be carefully considered by boat owners and owners of waterfront property,

most notably marina operators. Ice can present problems in a variety of ways depending on the nature of the harbor in question. In fresh or slightly brackish water with little or no current, the entire harbor surface can freeze. Boats that are trapped in such ice can have their hulls cracked by the pressure exerted by the freezing ice as it expands. A hull with sufficient slope to its sides may be just lifted by the ice without damage, while a hull with relatively vertical sides at the waterline will almost surely be cracked. In either case, only a very foolhardy boat owner would have his boat in such water during the winter months.

Fixed structures in harbors that ice completely or nearly so are usually strong enough to withstand the crushing pressure of ice, but may be susceptible to a different kind of damage. If the harbor has more than a very light tide rise, the pilings of fixed structures can become locked in ice and be pulled upward by the rising tide and, over a period of days or weeks, the structure can become deformed or even made structurally unsound.

River harbors fed by fresh water but with too strong a current for complete or nearly complete freezing can have a problem with floe ice coming downriver in late winter or early spring or during midwinter thaws. Ice floes weighing several tons and moving at one to three knots speed are quite capable of severely damaging or sinking boats at slips or on moorings and can severely damage or destroy fixed or floating waterfront structures as well. The ice comes from the more still waters upstream and even if it is rather thin at its source, it can "raft up" into much thicker floes as the

ice floes overrun each other at bridge abutments, buoys, rocks, or other obstacles in the river. Floe ice can also be formed at river mouths in the relatively still waters over intertidal flats and can be carried upriver on tide reversal, possibly with the same type of rafting that occurs with ice coming downriver.

The third form of harbor ice is so-called sheet ice which is relatively thin ice that either comes from still water areas upriver without rafting or forms in small bays and inlets along the river and then breaks away into the main current. Sheet ice is generally not as massive as floe ice and thus doesn't cause damage by virtue of size alone but the leading edge of such ice can cause damage to hulls, anchor or mooring lines, or light fixed structures by an abrasive or cutting action.

There are really only two solutions to the ice problem in those harbors that have it. (It should be noted that salt water bays and inlets or salt or heavily brackish straits generally have no ice problem except during extremely severe cold spells.) Ice formation in still water harbors can be prevented in the area of slips by placing bubblers beneath the boats. These are simply perforated hoses connected to a small air compressor. As the air bubbles rise to the surface they carry the relatively warmer bottom water with them and thus prevent freezing in the immediate area of the protected boats. Bubblers are relatively inexpensive to install and operate but it should be noted that in an extremely cold winter such as 1976-77 even bubblers were sometimes unable to prevent freezing in some

Massachusetts marinas. For floe ice the only solution is to construct ice deflectors which provide an ice-free lee behind them or to locate marinas in natural or manmade embayments out of the main current stream. These must be relatively narrow, however, or they may form eddies that could carry ice into the embayments anyway. As far as the boats themselves are concerned, steel or aluminum hulls can withstand much of the potential damage from floe ice and can easily navigate through sheet ice of moderate thickness. Wooden hulls, which are typical in the Massachusetts commercial fleet, should be equipped with ice sheathing, one inch thick oak belts near the waterline, for winter operation.

The Newburyport/Salisbury harbor has a swift current and is thus not susceptible to complete freeze-up (though local legend claims it has happened in the past) but it has a severe problem with floe ice. At present there are only about five relatively ice free slips available for commercial vessels during the winter months. Other boats operate from the Merrimac but risk ice damage and must take extra protective measures during periods of heavy floe activity. The protective measures may involve running to an ice free port (Gloucester), tieing up on the ice free side of a bridge abutment, or in some cases even staying under power and maneuvering to avoid the worst of the ice floes. All of these measures are costly, dangerous, or both, so ice is a major factor limiting fishing operations in the Merrimac in winter.

d) Channel Characteristics

Most boaters and commercial fishermen familiar with several harbors think of each as either "easy" or "difficult" to navigate. It is a subjective distinction usually based on such factors as the width of the navigable channel; its depth; its stability through time; its straightness (or lack of it); the clarity of marking (buoys and other navigational aids); the presence or absence of shoals, rocks, wrecks, or other navigational hazards; the ease or difficulty of seaward approach; and other related or similar considerations. Taken together, all of these factors tend to give a harbor the reputation of being "easy" if operators are able to navigate the channel in nearly all weather and tide conditions without undue fear of running aground or taking on water. Conversely, a harbor is "difficult" if the captain must have total concentration during ideal conditions and must be prepared for anything from white knuckle concern to abject terror if conditions are less than ideal.

As we shall discuss in some detail in Chapter Seven of this report, the Newburyport/Salisbury harbor is unfortunately much closer to the latter type of harbor than the former and any development plan for the harbor must be based on either improving that situation or, at the very least, making it no worse. Similar considerations should apply in development planning for other harbors.

Beyond the basic function of providing safety and security for both recreational boaters and

commercial fishermen, and in view of the basic characteristics of the harbor as outlined above, a modern small harbor must offer a variety of goods and services to its users. The purveyors of these goods and services usually encompass a combination of private marinas, boat clubs and yacht clubs, other waterfornt and community businesses and public facilities. In general terms, a full service small harbor should offer most of the services shown in Table III. 1.1 All of these services are desirable but not all are absolutely necessary. Likewise, the list is not definitive since, for example, some commercial boats are gasoline powered and some large yachts are diesel powered. Nonetheless, Table III. 1.1 is a good indication of the needs of a small harbor and the division of those needs among the two major user groups.

Table III. 1.1

SMALL HARBOR SERVICES

Services	Recreational	Commercial
Launch/Haulout Facilities	X	X
Mooring and slips (temporary and permanent)	X	X
Gasoline	X	
Diesel oil		X
Bait	X	X
Block ice	X	
Cube ice	X	
Broken ice		X
Fishing gear supplies	X	X
Fishing gear repairs	X	X
Fishing gear rental	X	
Marine hardware and supplies	X	X
Fresh water	X	
Shoreside power	X	
Motel or hotel	X	
Hull repair	X	X
Engine repair	X	X
Electronics repair and sales	X	X
Shopping area	X	
Navigational aids	X	X
Emergency assistance (Coast Guard)	X	X
Security (harbormaster)	X	X
Boat livery	X	
Charter boats	X	

Table III. 1.1
(continued)

Services	Recreational	Commercial
Party boats	X	
Unloading dock		X
Weighing/sorting area		X
Cold storage		X
Trucking service		X
Fish auction, brokers, or cooperative		X

III. 2 Harbor Facilities for Recreational Boating

A small harbor suitable for recreational boating offers several benefits to the community or communities it serves. Recreation for the boat-owning residents is an obvious benefit, along with the enjoyment that even non-boaters get from being near and being able to observe the harbor and its activities. Equally important is the economic benefit associated with a harbor in a small community. The harbor can be a substantial source of non-local income, i.e. money spent in the community by non-residents. The first beneficiaries of this outside money are the marina operators and fishing or boating supply retailers who sell goods and services to visitors. The luxury yacht owner on cruise may visit a harbor community for days at a time and spend hundreds of dollars on slip fees, minor repairs, and purchase of boating supplies. At the other extreme, an owner of a small trailered boat may spend only a few dollars on a boat ramp fee and a box of worms or a bag of ice cubes, but all of these expenditures taken together can mean a substantial contibution to gross local income.

The secondary beneficiaries of this process are the businesses serving the non-boating needs of visiting boaters, e.g. grocery and liquor stores, shops, restaurants, motels, etc. and those people or businesses who sell to these and the primary beneficiaries. Thus, a properly equipped small harbor can be an industry of substantial, though usually seasonal, importance to a small community in providing jobs and general economic growth. To do so, however, it must offer both local and visiting boaters a fairly broad range of the services mentioned briefly in the preceeding section.

a) Berths

The berthing system for recreational boats has two main purposes - to hold the boat safely when it is not in use and to provide access from the shore for the boat users and their gear and supplies. There are basically three ways to serve these purposes: the boat can be stored between uses on a trailer and launched and retrieved via a boat ramp; the boat can be moored (attached to a fixed bottom anchorage); or the boat can be berthed at a slip, moored to either a fixed or floating pier. These three approaches differ widely in cost to the user and in convenience as well.

The least expensive is trailering since it costs only $1-$3 per launch/retrieval and coincidentally requires the least waterfront footage for the marina. It does, however, require rather extensive associated parking to park the cars with trailers attached and one might well argue that the ramp fee is as much a parking fee as a ramp service fee. This is the least convenient method for the boat owner and the method is limited in the size of boat is can accommodate. There is no firm upper limit on the length or size of boat than can be launched this way since, for example, an owner who lives close by the marina may be willing to trail a considerably larger boat than someone who has to drive twenty or thirty miles at highway speeds. In general though, people rarely trail boats of more than twenty to twenty-five feet in length.

The next most expensive, and more convenient, method of protecting and accessing a boat is to moor

it to a fixed anchorage. Usually the boat is attached to a single point mooring and is free to rotate about the mooring point with wind and current changes. The owner may install his own mooring or rent a mooring from a private marina or club. Access to the boat is by rowboat or motorized dinghy and for individually owned moorings the owner usually leaves the dinghy on the mooring while he uses the boat, but the marinas and clubs usually provide a dinghy shuttle service along with the mooring rent. The shuttle service may be operated by a marina employee but it is also common to have one or more self-service motorboats. In the latter case the owner motors out to his boat and then tows the dinghy back to the pier where it is left for the next user. Moorings have the advantage of relatively low cost but they are an inconvenient and also somewhat dangerous means of accessing a boat, particularly for families with small children. Where possible, the operator will usually board and start his boat himself and then return to the pier to pick up his passengers and supplies. Unfortunately this may not always be possible because of the congestion it can cause at the pier during high use periods.

From the point of view of overall water use, moorings are inefficient because each boat must be allowed sufficient space to swing free about its mooring without danger of striking other boats, fixed structures, or the shoreline. The space requirements are even greater in a harbor with high tidal range since the length of mooring line or chain must be sufficient to accommodate the tide variations. Widespread use of moorings can also restrict navigation in or near the main channel.

For these reasons, most harbor development plans tend to avoid moorings as much as possible and to treat them as temporary solutions pending construction of additional slip space at the shoreline. In the harbor area of Newburyport/Salisbury however, moorings are a traditional method and their widespread use is unlikely to be significantly reduced, though the availability of suitable sites is such that, for the near future, significant growth in the number of moorings is likely to be quite limited.

Slips are the most convenient method of storing and accessing a boat and the means that most owners would choose were it not for considerations of cost and availability. (Slips in the study area cost about $15-$20 per foot of boat length for the season.) A slip is a dedicated length of dock space, i.e. the renter has exclusive rights to tie his boat there, alongside either a fixed dock or pier or a floating pier. Some slips consist only of the space itself while others, actually most, also provide fresh water and 110 volt electrical power. Electrical power has in the past been an integral part of the slip service but with the increasing use of air conditioners and other power-consuming appliances on the larger and newer boats, some marinas have begun to install electric meters at each slip and to charge for electricity usage separately from slip rental. Other marinas provide only limited electric service, via temporary extension cords, intended for occasional use of small power tools or emergency pumps and not for routine hotel services.

A relatively new alternative to the three most common berthing options is boat stacking, which is limited to the smaller boats without masts or other superstructures. The boat stacking facility consists of one or more large buildings equipped with boat storage racks with variable (vertical position) boat holders that act as shelves. The building or buildings are near the water's edge, which is a paved and bulkheaded apron. A special fork lift truck drives to the edge of the apron and lowers its forks into the water deep enough for the small boats to be brought over them. The boat is then picked up by the forklift which can drive into the storage building and place the boat on its assigned "shelf" until its next use. This system of boat berthing was originally developed in the southern states where the warm water permits substantial bottom fouling as a boat sits in the water between uses, but it is seeing some popularity up here as well because it requires little waterfront and provides excellent security from the elements and from vandalism and pilferage. The cost per boat for storage space is low but there is a large initial investment regardless of number of boats serviced so the method has had only limited use in New England and usually only in relatively large, in number of boats, marinas.

b) Launch/Haulout and Repair

Boat ramps and forklifts are adequate for launching and retrieving small boats on trailers but larger boats also require launch and haulout capability for emergencies, for routine bottom maintenance, and for access to winter dry storage in harbors with ice

problems. Several methods are available and in use in Massachusetts and they vary widely in cost and convenience.

The most convenient and usually most expensive is a wheel-mounted boat sling. This is a steel frame structure, usually gasoline or diesel powered and running on rubber tires, that is able to straddle a boat and pick it up or lower it via heavy reinforced rubber slings which are suspended from the upper frame of the structure by cable winches. The boat sling requires a pair of narrow finger piers with the same separation as the wheels of the boat carrier. In operation, the carrier is driven out on the finger piers and the slings lowered into the water. The boat is then brought into the space between the finger

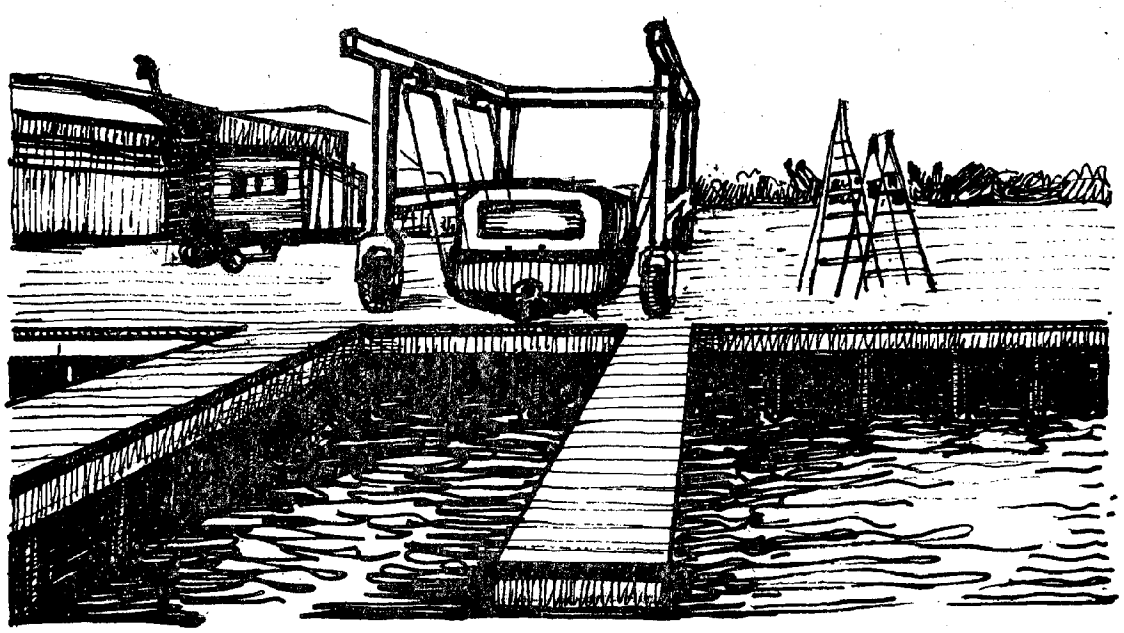


FIGURE III.2.1 BOAT SLING

piers, positioned over the slings, and lifted out of the water by the slings. Boat launching is just the reverse of the same process. In the yard itself, the boat can be moved freely and easily to or from its storage position or repair station with no more difficulty than driving a large truck. The yard need not even be paved. The whole operation of launching or hauling a boat can be accomplished in a few minutes by a skilled operator. It is, however, relatively expensive for the boatowner, and can cost upwards of $5 per boat foot for a short term haul-out for inspection or minor repairs and in the vicinity of $1 per square foot (boat length times beam) for haulout, winter storage, and spring launching.

Less convenient and less expensive variations on this method include rail mounted slings, similar in construction and operation to the above but without the flexibility of carrying a boat anywhere in the yard and without the expensive drive and steering mechanisms; slings lifted by conventional cranes mounted on tractor treads or truck bodies; and stiff leg derricks permanently mounted on the pier face. The latter two variations offer the least flexibility and involve the greatest skill since the boat is suspended from a single point and is extremely vulnerable to wind or even the motion of the crane, either of which could cause a pendulum effect that could be disastrous to boat or crane or both. All of the different variations on the basic idea are limited in the physical size of boat they can handle by the width of the straddle legs and by the lifting capacity of the winches combined with the structural strength of the carrier frame. A range of typical sizes

would be 15-25 feet in width and up to 60 tons in weight; though a 25 ton capacity is quite sufficient for a small harbor and could handle most boats up to 60 feet in length. Another important distinction between straddle carriers is whether the end toward the water is open or has a removable cross member. Carriers without this feature are unable to handle boats with masts, antennas, or tuna towers unless they are first removed.

Marine railways are perhaps the most common launch and retrieval system since the basic idea predates cranes and straddle carriers by decades or even centuries. The variations on the basic idea are too numerous to discuss here but the concept itself is simply a pair of rails extending from the yard level to well below the low tide water level. A sturdy carriage rides on the rails on steel wheels and can be moved up or down the tracks by means of an electric or other type of winch at the top and a pulley at the bottom. For launching, the carriage is pulled down until the boat floats free and for retrieval the boat is just positioned over the carriage and both the boat and carriage are pulled toward shore until the boat rests firmly on the carriage. Either operation can also take advantage of the tide by lowering the boat/carriage at low tide for launch or positioning the boat over the carriage at high tide for retrieval. For our purposes there is no upper limit on the size of boat that can be handled by a marine railway since railways with capacities of thousands of tons have been built. In a small harbor, however, a 50 to 100 ton capacity would be more than adequate and relatively inexpensive to build. Marine railways are generally used for ship or boat construction and/or repair on

the railway itself and are not suited to routine haulout for storage. They are inflexible and require some auxiliary means to move boats around the yard and to and from the launch cradle if they are to be used as part of a dry storage scheme.

Perhaps the simplest launch/retrieval method for larger boats depends almost entirely on the tide and consists of little more than a couple of channel iron tracks and a portable winch or truck. Boat cradles are built on wooden sleds which can be literally dragged around the yard over greased boards which are laid in by hand as needed. To launch a boat, the cradle is hauled down the channel iron tracks at low tide and the boat is floated off at high tide. To retrieve a boat, the cradle is pulled down and positioned at low tide, the boat positioned over it at high tide, and boat and cradle hauled up at the next low tide. The whole operation requires a good deal of skill and planning and takes some time but it is very inexpensive and highly flexible for both short term haulouts and for winter storage.

In conjunction with a launch and haulout facility of whichever type, a boatowner will also need access to repair services for the hull and engines and his electronic gear including radios, radar, sonar, fish finders, Loran sets, and so forth. Most boatowners do their own routine maintenance, but even long time boatowners have occasional need for professional assistance in one or more of the above areas. In support of the do-it-yourself part of boat maintenance, however, most marinas carry a fairly full line of marine hardware, paints, and other boating supplies

both as a service to their tenants and because the sale of such supplies can equal or exceed the revenues from storage and other services in many marinas.

c) Boat Operating Services and Supplies

Any marina usually derives a substantial portion of its revenues from the sale of goods and services associated with the daily operation of pleasure boats. Conversely, a marina that does not offer a full line of these needs will not be as attractive to the boating public. The bare essentials are fuel, bait, and ice. For pleasure boats, gasoline is by far the most common fuel, though the larger cruisers may be equipped with diesel engines. Bait for pleasure boaters and fishermen usually means small quantities of sea worms, eels, sea clams, and similar baits plus a large assortment of artificial lures and baits. Big game sports fishermen, which usually means tuna rod-and-reelers in Massachusetts, also need large bait such as squid, mackerel, herring, or whiting by the hundred pound box, but the demand for such bait is usually too spotty for a marina to justify stocking it in sufficient quantities. Recreational boaters also need ice, usually in ten pound bags of cubes or in similar size blocks of ice for cooling refreshments and bait or for ice boxes. Many marinas handle ice via coin operated vending machines serviced and stocked by an outside firm on a royalty basis.

Aside from these bare essentials, most marinas also stock a wide range of other boating supplies ranging from candy bars to waterski tow ropes to navigational charts, as well as a full line of fish-

ing equipment such as rods and reels, tackle boxes, etc. Quite frankly, however, many boaters look on a marina as the supplier of last resort, on the assumption that their prices are the highest, and attempt to purchase as many of such supplies as possible at non-marina sources such as sporting goods stores or hardware stores. Whether or not this assumption is correct, it is a significant factor in the marina business.

d) Rentals and Charters

Not all harbor users or potential users own their own boats or their own fishing gear and a full service harbor will offer attractions to both owners and non-owners. Boat liveries, where a small boat can be rented by the hour or day, seem to be more common on lakes or ponds than in harbors, but are still found in many small harbors. Larger boats, such as cabin cruisers, sports fishermen, or sailing yachts are generally available for rent only by the week and only after extensive reference checking to assure that the renter is capable of handling such a craft. Also, such craft are usually privately owned and rented through brokers by owners wishing to offset part of their boat owning expenses.

The more common form of charter is the daily or weekly charter of a boat with crew. There are numerous charter boats operating in Massachusetts harbors in this manner and the usual market is the sports fisherman who goes after tuna for one to four days at a time. (In such cases, the charter fee does not include the right to keep the catch - it

is sold as a vital part of the income to the boat owner/operator. The charter parties who go for smaller fish - blues, mackerel, bottom fish, etc. - can keep their catch if they wish.)

Party boats or "head boats" are a growing business in Massachusetts harbors and are extremely important in the study area. A party boat is generally a fairly large boat, say upwards of 50 feet long, and designed with lots of rail space to accommodate rod and reel fishermen all along its periphery. They operate on day or half-day trips for a head fee of $10-$15 per day including bait. Most boats will also rent gear so that a would-be angler needs only a lunch and the head fee and rod rental to go deep sea fishing. Patrons of party boats in the Newburyport/Salisbury area regularly come from all over New England and as far away as the Midwest and are an important source of tourist business in the area.

e) Navigational Aids and Security

All of the services we have been discussing thus far are commercial services provided by private businesses (or clubs) for a fee, but the most important services, affecting the safety and security of the boat and its occupants, are provided by public bodies with no user fee involved. Navigational aids such as buoys, lights, bells, horns, radar reflectors, and the like are placed and maintained by the U. S. Coast Guard. The Coast Guard is also responsible for policing boating safety regulations and for search and rescue missions when boats and their occupants become endangered by weather or accident.

Channel maintenance itself, along with construction and maintenance of breakwaters or similar fixed structures are the responsibility of the U. S. Army Corps of Engineers and the manner in which the Corps and the Coast Guard act together to maintain and mark a harbor channel will be of critical importance to the attractiveness of that channel to locals and visitors alike. As we have noted, the form and marking of the channel into Newburyport/Salisbury is poor in summer and terrible in winter and has been a major factor in preventing the growth of summer cruise business and winter commercial fishing.

Harbor security, dealing with prevention of theft and vandalism, placement of moorings and slips, and prevention of reckless operation, is usually the responsibility of the harbormaster or some other holder of local police powers. Theft and vandalism have become an increasing problem in many harbors, particularly in the case of portable and valuable equipment such as CB radios, and the policing needs of small harbors may well be outdistancing the ability of part-time harbormasters to supply them. A harbor with a poor reputation in this area will, of course, become less attractive to visitors.

f) The Harbor Community

Thus far, we have been discussing only the services available in the harbor itself, but to non-local boaters and other harbor users the character of the adjacent community can be equally important. In the first instance, each type of visitor will

be looking on some non-harbor services either as essential or at least highly desirable. For example, trailer boaters on day trips would like to be able to buy gas for their cars and food and other refreshments for their boat trips. If they are on vacation, they will look for inexpensive lodging near the harbor or, increasingly, facilities for camping or motor home parks. Users of party or charter boats will look for similar services and are usually especially interested in accomodations. Cruise boats are generally not interested in accomodations but would like a harbor that is conveniently located to supermarkets, liquor stores, and other shops. All types of harbor users are interested in restaurants and entertainment possibilities as well. In all cases, the harbor is more attractive if these various services are located relatively near to the harbor and its boating facilities.

Beyond these rather basic services, however, a community that is of interest to tourists independently of its harbor will attract even more non-local harbor users since their visits can combine boating with sightseeing or shopping. This is especially true of the cruise trade since they will usually choose their stop-overs primarily by the non-boating attractions a given community offers. The cruise trade is probably the more economically important segment of the boating industry in a harbor in terms of net local income per boat so any harbor community would be well advised to make the harbor as attractive as possible to visiting boats of this type. In the study area, the Salisbury side offers very little in this category since the Salisbury waterfront is rather remote from both the town center

and the beach and amusement park part of the Town. On the Newburyport side, however, the main part of the waterfront area is located within easy walking distance of the fully restored historic central business district and offers both convenience and tourist possibilities to visiting boats. By 1978, the harbor will become even more attractive with the completion of a landscaped waterfront park contiguous to the central business district and equipped with publicly owned guest slips specifically for visitors.

III. 3 Harbor Facilities for Commercial Fishing

A small commercial fishing industry can survive in what is basically a recreational boating environment, indeed that is exactly the case in the study area; but to really thrive and grow it should have some special facilities in addition to those outlined above for recreational interests. Some of these are rather easily and inexpensively provided by the fishermen themselves or the recreational marinas that service fishermen as a sideline. Others, however, can involve substantial investment and/or require significant institutional structures to support or operate them.

We have pointed out that the vast majority of recreational power boats use gasoline as their fuel, the only usual exceptions being large yachts and charter or party boats. Among commercial fishermen, however, there is a strong preference for diesel engines and therefore a need for diesel fuel at the waterfront. Lacking a regular supply of diesel fuel at the waterfront there are, as with most of the special needs of commercial fishermen, ways around the problem, but each involves added expense or inconvenience or both. A diesel commercial boat could, for example, fuel up at a harbor other than its home port, but this can involve extra steaming time. Alternatively, the fisherman can haul his own fuel to the waterfront in 55 gallon drums or can sometimes arrange to have home heating oil delivered by truck to his boat as an acceptable (and sometimes cheaper) alternative to marine diesel oil. There are, as we have said, ways around this and other problems for commercial fishermen, but each always involves a less than ideal *ad hoc* arrangement.

For some types of commercial fishing, such as lobstering, tuna fishing, and longlining, bait of a different type or in larger quantities than used by recreational fishermen is needed. For tuna fishing, for example, both handliners and harpooners (the two common methods of commercial tuna fishing) use as much as one to three hundred pounds per boat per day of fish such as herring or whiting as chum bait. The usual alternatives for obtaining this bait are to steam to a large port such as Gloucester, to truck it from a large port, or to purchase it at sea from a commercial trawler. The first two options involve added time and expense while the third requires time and sometimes a bit of luck in finding a trawler that has the right kind of fish to sell. The small trawlers that may share a harbor with the tuna boats (they may even be the same boats in the off season for tuna) usually don't have enough of such fish to sell in harbor and in any event have no facilities to store it in sufficient quantities to provide a stable supply.

Ice is another commodity which commercial fishermen need in greater quantities and different form than recreational boats. While a recreational fisherman may need ten to fifty pounds of ice per day as cubes or blocks, a commercial fishing boat will need hundreds or even thousands of pounds of bulk crushed ice. As we have found in the course of this study, the small harbors of Massachusetts simply don't have the facilities to supply this vital commodity in the quantities needed by small commercial fishing boats. The alternatives are to steam to Gloucester or Boston for ice, to truck it in from the same two ports, to buy crushed block ice from expensive sources dealing mainly in home use or restaurant and catering markets, or to use no ice or less ice

than actually needed to preserve the catch. Again, each solution to the ice problem involves expense, inconvenience, or both.

Perhaps the most important need for commercial fishing activities is a facility for unloading, weighing, sorting, and storing the catch. The facility could be a dedicated unloading dock run by a cooperative, a community, or a private commercial operator or it could be a marina dock that is readily available to commercial fishermen. To properly serve its function in even a rudimentary sense, however, the unloading facility should have sufficient dock space for the largest boat in the local fleet; dock area or apron for handling and sorting the catch; a crane for moving the catch from the boat to the dock and supplies vice-versa; minimal cold storage capability; and easy access to trucks. If the dock is used for purposes other than commercial fishing operations, the commercial fishermen should have at least equal priority with the competing user and the use charges should be reasonable even on days when fish prices are low. Scales, forklift or hand trucks, and storage area for fish boxes and related gear would also be needed in such a rudimentary facility.

CHAPTER IV: COMMERCIAL FISHING IN SMALL HARBORS

Though the title and outline of the study deal with the broad question of small harbor development, it has been the understanding of all connected with the study that the main impetus of the study should be a concern for commercial fishing in the small harbors of the Commonwealth. The enactment of the 200 Mile Resource Management Act was a major factor in the genesis of this project along with a general concern at both the State and local levels that the smaller fishing boats and the smaller harbors could get lost in the shuffle of the larger ports in reaping the benefits of the potential revitalization of the New England fishing business.

In order to place this business in its proper perspective, the study team decided to briefly review the background of New England fishing and the methods it uses, both at sea and in port. Not coincidentally, this review of the industry will also highlight some of the shoreside facilities needed to support and nurture the industry in a small harbor.

IV. 1 Historical Background

Massachusetts and New England have a long and well-documented tradition of the sea, and fishing has always been an important part of New England life, whether for sustenance, commerce, or recreation. Beard[1] gives rather a graphic description of the degree to which New England fishermen have pursued their trade and of the importance of fishing to the regional economy:

> "Long before any colonies had been started, English sailors had embarked on large-scale fishing off the coasts of Newfoundland, and the early explorers had excited English interest in this business by glowing reports of haddock, cod, mackerel, and whales in unlimited quantities in the waters of that region. The Pilgrims at Plymouth and the Puritans at Massachusetts Bay, shortly after their arrival, began to build small boats and send out fishing expeditions. In time Boston, Salem, Marblehead, and a few other towns became busy ports for the fishing industry; and all down the coast fishing became a source of lucrative trading.
>
> "Besides furnishing supplies to American markets, fishermen cured and packed huge quantities for export. But the English themselves were extensively engaged in this industry, and American fishermen had to seek other than British markets. They found them principally in France, Portugal, Spain, and the West Indies. On the basis of this exchange an immense business was built up. The fish shipped to Spain, for example, were exchanged for citrus fruits and specie, and the specie was used to pay for English manufactures. The fish sent to the West Indies were traded for sugar and specie; a part of the sugar went to the colonies and another part, with the specie, went to England to pay debts and buy manufactures.
>
> "With particular doggedness the fishermen of New England turned to whaling. At first they concentrated their efforts largely in the waters

---

1 C.A. Beard; M.R. Beard; "A Basic History of the United States"; The Blakiston Company; Philadelphia; 1944.

off Newfoundland, but in time they pushed their enterprise all over the Atlantic, using the ports of New Bedford and Nantucket as their chief bases of operation.

"So extensive were their whaling voyages and so daring were their undertakings that Edmund Burke, when in 1775 he warned the British Parliament against 'ill-considered' tampering with the strength and independence of Americans, paused to give dramatic picture of their whaling industry: 'Look at the manner in which the people of New England have of late carried on the whale fishery. Whilst we follow them among the tumbling mountains of ice, and behold them penetrating into the deepest frozen recesses of Hudson's Bay and Davis's Straits, whilst we are looking for them beneath the Artic Circle, we hear that they have pierced into the opposite region of polar cold, that they are at the antipodes, and engaged under the frozen serpent of the South . . . Nor is the equinoctial heat more discouraging to them, than the accumulated winter of both the poles.

"'We know that whilst some of them draw the line and strike the harpoon on the coast of Africa, others run the longitude, and pursue their gigantic game along the coast of Brazil. No sea but what is vexed by their fisheries. No climate that is not witness to their toils. Neither the perserverance of Holland, nor the activity of France, nor the dexterous and firm sagacity of English enterprise, ever carried this most perilous mode of hard industry to the extent to which it has been pushed by this recent people; a people who are still, as it were, but in the gristle, and not yet hardened into the bone of manhood.'"

Captain John Smith was among the first to actually exploit the New England fisheries and operated fishing fleets from Monhegan Island in Maine during the summer months. By the seventeenth century, fishermen of the colonies were operating on a lay (share) basis which apportioned one third of the catch to the vessel, one third for the supplies, and the remaining third to the crew. Variations on this same system survive to the present in both the smaller boats of the small harbors and the large draggers

operating out of Boston, Gloucester, and New Bedford. During this period, fish were generally caught by hand-line, either from boats or the shore, or by weirs used to trap near-shore schooling fish. The Plymouth Colony operated a herring weir as early as 1641 and by the time of the Revolution, herring were being caught all along the coast from Newfoundland to North Carolina. Other species were also being taken during this same era, notably mackerel, pollock, sturgeon, shad, bass, cod, and clams.

In the early post-Revolutionary period, the Federal government took the first of many steps to encourage and protect the domestic commercial fishing industry by offering a bounty of five cents for each quintal (112 pounds) caught. Shortly thereafter the government also took the first of many steps to protect domestic ship-building with the passage of the Jones Act of 1790 which required all documented fishing vessels operating out of U. S. ports to be built in domestic boatyards or shipyards. (The Jones Act in amended form survives to the present and requires, among other things, that all vessels operating between U. S. ports be American-built and American-crewed and owned.)

During the nineteenth century, significant advances in off-shore and near-shore fishing techniques, such as gillnetting and dory fishing, took place and contributed to rather substantial increases in landings for some species. For example, mackerel landings in New England were averaging only 3,100 tons per year during the period 1804-1818, but averaged over 41,000 tons per year in subsequent years through 1885. In the latter part of the nineteenth century processing developments contributed to the expansion of the New England fishing business,

sometimes rather dramatically. The first sardine canning factory in Maine was not built until 1875 yet, within nine years, there were 45 successful sardine canning operations in that state. Prior to the development of canning, lobster was restricted to coastal markets and was not an especially valuable resource. (Legend has it that the early New England settlers used lobsters as fertilizer for some crops, a concept that is rather hard to imagine in view of today's live lobster prices!). As a canned product, however, inland markets were reachable and by 1889 the sail and hand powered lobster fleet of New England was landing some 30.5 million pounds per year, a rate not attained again until very recently, even though gasoline and diesel engines and mechanical pot-haulers have been in use for several decades. The most significant change in fishing technology, however, was the onset of powered boats (steam) in the late 1800's since this permitted the development and use of trawling in its many forms, a much more efficient fishing method than the longlining and handlining it replaced. Trawling of course is the mainstay of the groundfishing fleet of New England to this day.

IV. 2 Fishing Vessels and Gear

Though many readers of this report may already have some familiarity with New England and Massachusetts fishing methods, the study team felt that a brief overview of the industry would be of some interest to those who may become involved in small harbor development but who do not have a fishing background.

The equipment used by a commercial fisherman in New England can be as simple as a rake and bucket (for soft-shell clam digging) or as complex as a large (by U. S. standards) stern trawler capable of sea voyages of up to two weeks. At either end of this spectrum, the equipment tends to be rather specialized and used for only one or a few fisheries or species. In the broad middle, however, the equipment that is most common to Massachusetts small harbors may be used in several quite different ways in the course of the year. There is no formal classification system for the different fishing methods, but the following are fairly representative of what one might find operating in or from a Massachusetts small harbor:

a) Digging

Soft shell clams are dug from intertidal flats in a number of harbor areas of the Commonwealth and could be dug in many other areas were it not for pollution considerations. No boat is needed and the capital investment is essentially nil. Scallops, sea clams, and oysters are also harvested by digging, but a fishing boat equipped with appropriate dredging equipment is required.

b) Traps or Pots

A pot (also known as trap) is in the most general sense a rigid device that operates by luring the species through a funnel type opening to get to bait; once inside, the catch is unable to retreat back through the funnel and remains in the pot. Pot size, design, and material varies between fisheries and areas; however, the lobster pot is the most common in New England and, for inshore lobstering is usually made of wood. In addition to the familiar lobster pot, similar types of traps are sometimes used in New England to harvest crab, eel, shrimp, and groundfish, usually on bottom that is too rocky to be trawled. Lobster pots are set individually or on a mainline with up to 10 pots per "string". In the waters of Marblehead and Swampscott in Essex County and Gosnold in Dukes County pots must be set individually. A single wooden pot usually costs $10-$15 , and an individual fisherman can fish as many as 1000 pots although the average is much less. The pots are hauled every day or every other day in the warmer months and less frequently during the winter when the lobsters are less active.

c) Hook and Line

There are two major variations on commercial hook and lining - handlining and tub trawling or longlining. Handlining involves a single (or a few) baited hooks on a heavy (say ¼") line which is hauled in by hand when a strike occurs. It is usually used only for large and valuable fish such as bluefin tuna and may be accompanied by "chumming"

which consists of throwing pieces of bait fish overboard in the vicinity of the baited hooks to attract the large fish. Tub trawling is the local term for long-lining which consists of trawling a long line (on very large boats it may be several thousand feet long) equipped with many short lengths of line carrying baited hooks at intervals of a few feet. The baited longline itself is usually coiled in tubs for ease of handling and hence the name "tub trawling" is frequently applied to this type of fishing. The longline can be set on the bottom or on the surface depending on the desired species and, like the gill net, can be used on rough ground and by smaller boats. In actual practice, the operation of baiting, setting, and retrieving a longline without tangling requires a fairly high level of skill and hydraulic linehaulers are generally expensive.

d) Harpooning

Harpooning is obviously limited to very large fish that surface feed, most notably the Atlantic bluefin tuna. Usually the harpooner stands on a platform extending some six to fifteen feet forward of the bow of the boat, the pulpit, and the boat is maneuvered in such a way as to position him over the fish so that he can place or throw the harpoon. The harpoon itself is simply a spear with a detachable barbed tip, the dart, and is usually eight or ten feet or longer depending on boat size and the height of the pulpit above water. The dart is attached to a line with one or more floats on it and the fish is caught as it exhausts itself by fighting the buoyancy of the floats and/or the fisherman hauling on the line. Boats as small as sixteen

foot outboards have been used as harpoon platforms, as have draggers up to sixty feet or more.

e) Otter or Bottom Trawl

The bottom trawl is essentially a funnel made of netting which catches and herds the fish in its path into a pocket at the end, called the "cod end". In order to strain the largest amount of water through the net, "otter boards" or "trawl doors" are attached to the wings of the net and to the towing cable of the trawler. The resistance of the water to the forward motion of these boards, which are at an angle to the direction of the tow, causes them to pull in opposite directions and keep the mouth of the net open. At the top of the forward end of the net, floats are fitted to the "headrope" to give it buoyancy, and at the bottom of the forward end chains and sometimes rollers are fitted to the "groundline" to keep it in contact with the bottom and reduce abrasion. The net is "shot" when the vessel arrives at the fishing grounds and then towed, usually at about 3-4 knots, for approximately two hours until it is "hauled back". The tow cable is then winched in until the cod end of the net is over the deck, at which point a releasing knot is pulled and the catch is dumped on deck or into a sorting bin. The net is then shot again and the entire operation is repeated. The mesh size for various types of nets is regulated to try to reduce the catch of juveniles, and since the net catches everything in its path, the species with low or no commercial value, "trash fish", must be sorted out and thrown overboard.

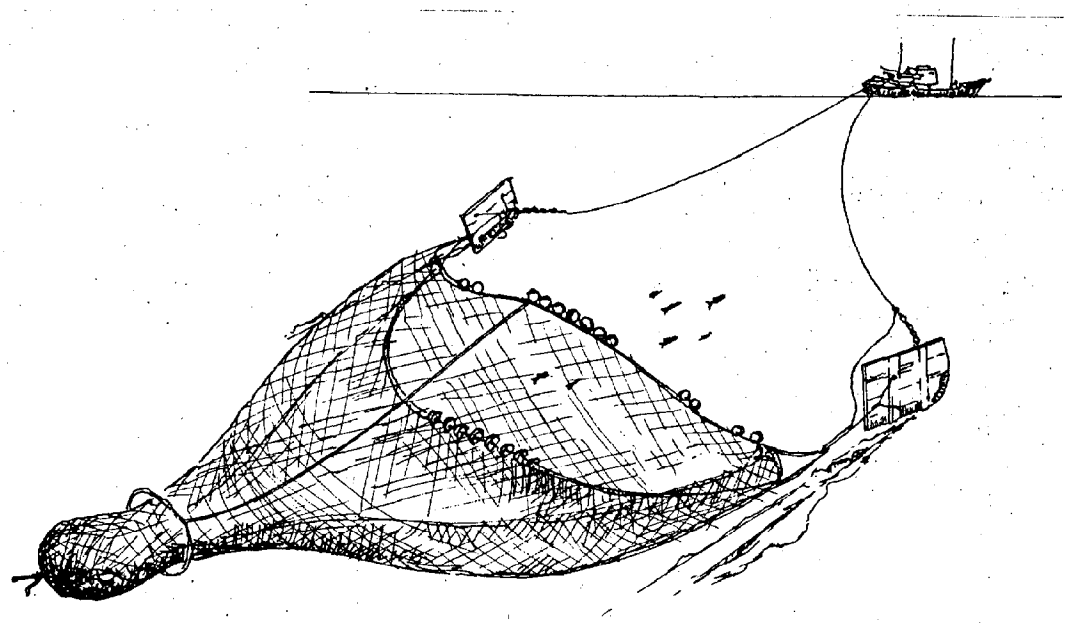


Figure IV.2.1 Otter Trawl (reprinted from "A Guide to Fishing Boats and Their Gear"; C.A. Blair and W.D. Ansel; Cornell Maritime Press, Inc.; Cambridge, Maryland; 1968)

f) Gill Netting

A gill net is a stationary vertical net that is held in position by weights at the bottom and corks or floats at the top. The mesh material is very light and the mesh is sized so that the fish can pass only partly through the net and are caught by the gills when they attempt to back out. Depending on the species being fished, the weights and corks can be sized to place the net at the bottom, at mid-water, or near the water's surface. After the net has been in position for several hours it is winched aboard the vessel and the fish are removed and sorted by hand. As with the otter trawl,

the gill net is indiscriminate as to species but is size specific. The gill net has an advantage over trawl nets in that the net dimensions are nearly independent of boat horsepower and size, but gill nets are expensive and, because of their light construction, rather susceptible to damage.

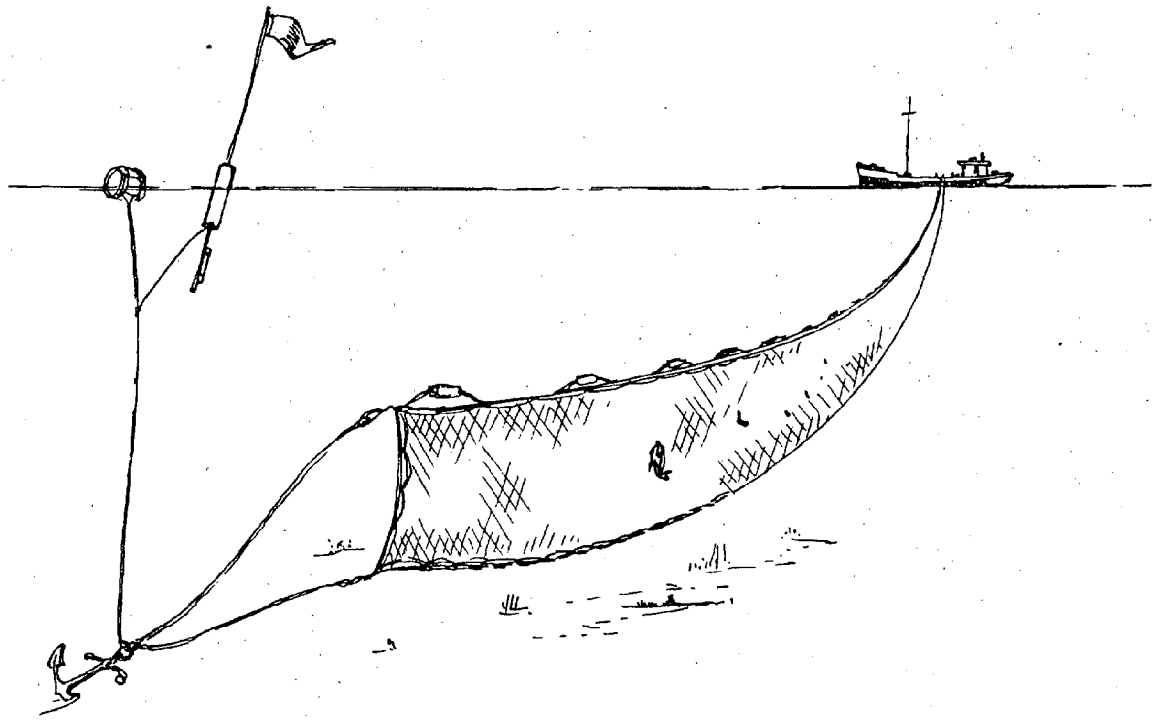


Figure IV.2.2 Gill Netting (reprinted from "A Guide to Fishing Boats and Their Gear")

g) Purse Seine

A purse seine is limited to schooling fish at or near the surface. The net is set in a vertical ring surrounding a school of fish. The net is kept vertical by weights and floats and after the school is surrounded, a drawstring on the bottom of the

net is tightened to "purse" the net and concentrate the fish in a small area at the surface. The pursed net is then drawn alongside the boat and the catch is brought aboard for sorting and storage either by means of a fish pump or by "brailing", scooping the fish out of the pursed net with a small net on a long pole. Purse seining is more species specific than the other trawl or gill net; but requires both speed and skill in setting the net, pursing it, and bringing the catch aboard.

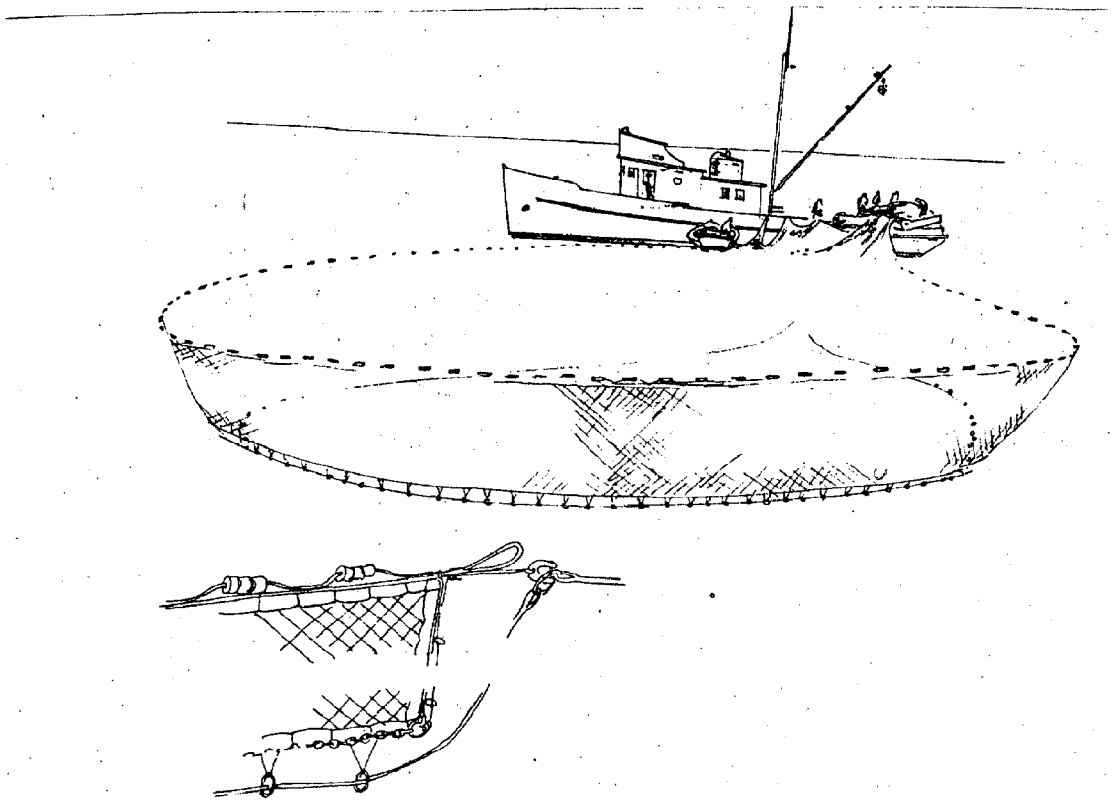


Figure IV.2.3 Purse Seine (reprinted from "A Guide to Fishing Boats and Their Gear")

Some commercial fishing vessels of the type commonly in use in Massachusetts small harbors may shift among two or more of these methods during the course of the year, fishing for different species and possibly operating from different ports. An example of what a single boat might do would be to fish for bottom fish in the winter using an otter trawl or gill net; shift to lobstering using pots or scallops using a dredge later on in the winter; shift to longlining or tub trawling cod and haddock in the spring and early summer; spend the summer after tuna on handline, by harpoon, or by rod and reel; harpoon swordfish in late summer and fall; and then complete the cycle by going back to trawling for groundfish in winter again.

Based on his need for facilities, the location of the fish during a given season, and other factors, this same boat may at times operate out of his home port, say Newburyport, and at other times may berth in Gloucester or even as far away as Provincetown.

The vessel in question is typically a wooden vessel of considerable age, though newer vessels are more often built of fiberglass reinforced plastic or metal. Steel is the usual hull metal though some West Coast and Gulf Coast boats have been built of aluminum, which is much more expensive to build but easier to maintain. The newest boat hull material, ferro-cement, has not yet been used in fishing boat construction.

A study of commercial fishing vessels in the state of Maine has shown that the average age of documented vessels with a length greater than 70 feet was 33 years and for vessels with a length less than 70 feet was 22.5 years. While these figures are not necessarily identical

in Massachusetts, they are a good indication of the situation here. A tour of the Newburyport/Salisbury harbor or any other small harbor will usually show the fleet to be old and small. Very few new boats enter the fleet, though the 135 footers operating out of Boston are a notable exception; rather, "new" fishing vessels are frequently conversions of old boats that were formerly in some other service such as pleasure cruisers, yachts, party boats, ferries, offshore work boats, or even, in one instance, a military landing craft. The few new boats added to the fleet have been in the 45-70 foot range (plus the large Boston boats) and are either custom built in local yacht yards or, with increasing frequency, are semi-stock vessels built along the Gulf Coast.

In the smaller harbors of Massachusetts, the commercial fishing vessels are generally in the 30 to 70 foot range, with the smaller sizes predominating. Because of this, the small harbor fleet generally operates in the near shore fisheries, less than four or five hours steaming time from home port, on day trips or an occasional two-day trip. The larger vessels operating out of the three major ports, by contrast, may be out for as long as 10-14 days at a time. This is an important difference between the two fleets, even though there is some overlap in fishing pattern between the "large" boats and "small" boats. Larger boats have a lower unit cost structure and are less constrained by weather and able to spend a much greater percentage of time on station, i.e. fishing. The smaller boats have a higher unit cost structure but can, through proper marketing, offset this somewhat by getting higher prices for their fresher catch. The operative word here is "can" and in reality few of the small boats have taken full advantage of their short trips and fresher catch.

IV. 3 Species Fished

The species fished by commercial and recreational fishermen in New England are numerous and include - bluefish, butterfish, eel, flounder (blackback, dab, fluke, grey, sole, yellowtail), cod, cusk, haddock, halibut, pollock, red hake, whiting, menhaden, sea herring, bluefin tuna, mackerel, porgie, sea bass, swordfish, wrasses, ocean perch, monkfish, wolffish, ocean pout, shrimp, soft-shell clams, surf clams, ocean and bay quahaugs, ocean and bay scallops, crabs (blue, red, green, rock, and Jonah), lobster, oyster, and squid. Some of these species have a highly seasonal component (such as bluefin tuna, swordfish, shrimp and whiting) while others are available in commercial quantities throughout the year. Many of these species have only a limited domestic market and are taken mainly as incidental catch or are even treated as "trash fish", to be sorted from the desired catch and thrown overboard. Squid is an example of a species that has a very limited market, mainly among Mediterranean ethnic groups, but beyond that has no value.

Other species are always considered trash and a considerable nuisance to boot. Dogfish is a type of small shark and is quite numerous in New England waters during the summer and fall. Though not deadly by any means, they can give a nasty bite and are difficult to remove from nets or from longline hooks. They have no domestic commercial value and are considered an extreme nuisance yet this species is actively fished in Europe and has a fairly high price. For example, Denmark exported over 1.2 million pounds of fresh greyfish (dogfish) to West Germany in 1973 at an average price of $1.33/pound. In the same year West Germany imported nearly 5 million pounds of frozen greyfish at an average price of $0.40/pound - including a

trial shipment from the U. S. of 24,000 pounds at $0.51/pound.

New England fishermen in general and small boat fishermen in particular tend to favor the high valued species that are most popular among American consumers and thus command the highest prices. Typical of this group are cod, haddock, flounder, lobster, tuna (exceptional in that it is a very high valued fish with predominantly foreign rather than domestic market), swordfish, scallops, and soft shell clams. The processing sequence for these species varies widely. The simplest of course is for lobster and clams which are sold live to the consumer, though most Massachusetts clams now require some treatment in the form of depuration which is discussed in some detail in Volume II of this report. Groundfish require a much more complex processing sequence that begins on board the boat where the fish are gutted (entrails removed) and usually sorted by species and iced or otherwise cooled. Again we note that some small boat operators on short day trips sometimes forego icing in the cold months. When the boat returns to port the fish is sold either at auction or via broker and then becomes the property of a processor.

The processor has several options available to him and, depending on market conditions, can sell the fish as fresh whole fish, fresh fillets or steaks, frozen fillets or steaks, or can freeze the fillets as fish blocks. Frozen fish block is a relatively recent commodity in the past twenty to thirty years and it has dramatically changed the nature of the fish business, both expanding the market for fish and introducing significant foreign competition in domestic markets. Frozen fish

block is a compressed block of fish meat, of similar color and texture but not necessarily a single species, that is cut into individual portions or sticks. The portions or sticks may be breaded or unbreaded, cooked or uncooked, and are sold either as a frozen retail product or through fast food outlets. Plants that process fish block can take as input either domestically landed fish, fish landed in Canada and shipped here by truck or rail, or fish blocks from other countries sent here by ship. It is ironic that fish can be caught a few miles offshore by a foreign vessel in competition with New England boats, processed on board, carried back to the vessel's home country, and then shipped back to the U. S. as imported fish which competes again with the domestic fishermen in the retail market. During 1976, total U. S. imports of groundfish exceeded 600 million pounds of which some 7.2 million pounds were imported from Canada as fresh rather than frozen fish.

Atlantic bluefin tuna is an interesting contrast to the groundfish industry. The vast majority of the American catch of this fish is landed in New England ports and, in fact, most of that is landed in Gloucester and Newburyport. Roughly half of the landings are by harpoon and handline for strictly commercial purposes and half by rod and reel by sports fishermen who sell their catch to the same market as the commercial fishermen. There is a very limited domestic market for these fish but a very strong market in Japan where the fish is considered a delicacy and consumed as sashimi (raw fish). Tuna are landed whole and gutted and headed at the dock. They are then packed in ice in airfreight containers, trucked to New York, and flown to Tokyo where the meat can command up to $10 per pound. It's an expensive process,

but the net back to local fishermen can still be as high as $2 per pound or more, ex-vessel.

IV. 4 Marketing and Fisherman Income

Fishing prices at the ex-vessel, wholesale, and retail levels are volatile on a monthly and daily basis. Figure IV.4.1 shows recent ex-vessel prices (what the vessel receives for its catch) and retail prices on a monthly basis for cod, and New England landings for this species. On a daily basis, price fluctuation can be extreme, as indicated by Figure IV.4.2 which shows landings and ex-vessel prices during January and February of 1977.

The daily unit price to be paid for various species is determined at auctions held in Boston and New Bedford. These prices are compiled by the National Marine Fisheries Service and are available by telephone and are published in the Market News Report, called in New England "the Blue Sheet". Processors at ports other than Boston and New Bedford establish a price differential for their particular ports; for example the Gloucester price tends to be about $0.03/pound below the Boston price, but the Blue Sheet price is not an absolute figure and there may be some differences in price among processors or buyers within any given port. Once the catch is sold to the buyer, the income is divided between the vessel owner and the crew. A "lay" system is usually used with the details of the "lay" varying from port to port and boat to boat. One in fairly common use is the "broken 40" lay, the details of which are: the Gross Stock is calculated by multiplying the ex-vessel price for each species by the poundage landed and then summing for all species. From the Gross Stock the costs of fuel, ice, welfare fund (if any), bonus for mate and engineer, and lumpers (unloading) are deducted to give the Net Stock. The Gross Crew Share is equal to 60% of the Net Stock

FIGURE IV.4.1

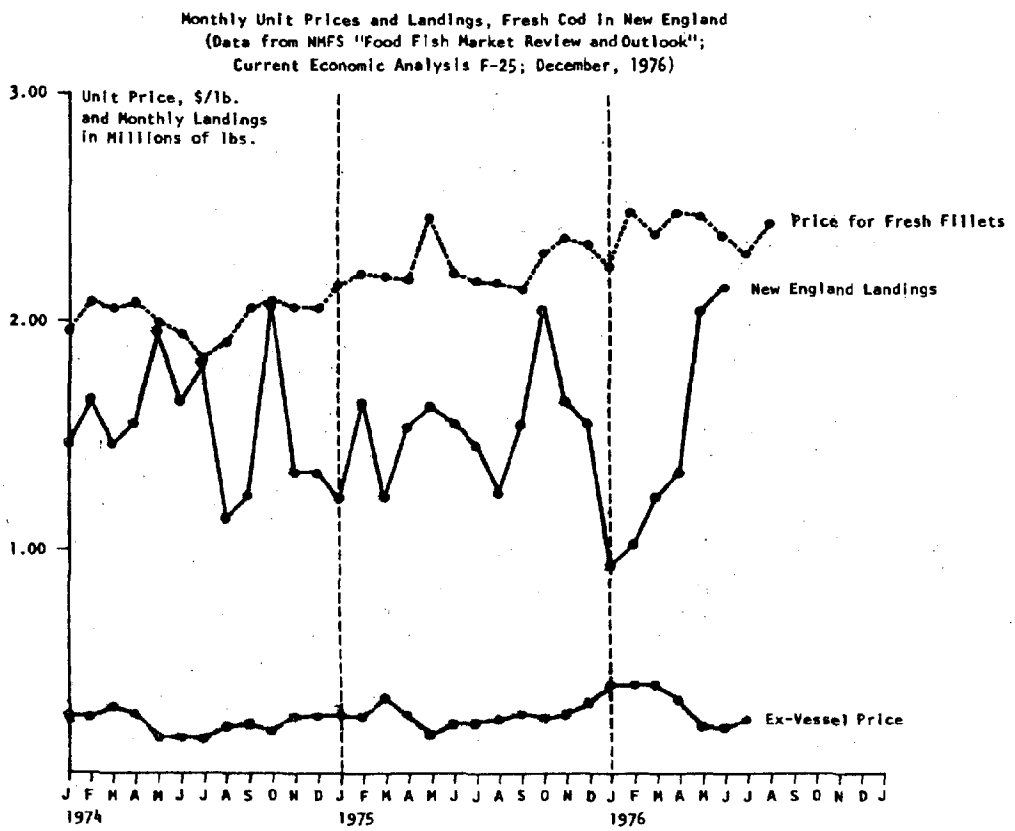
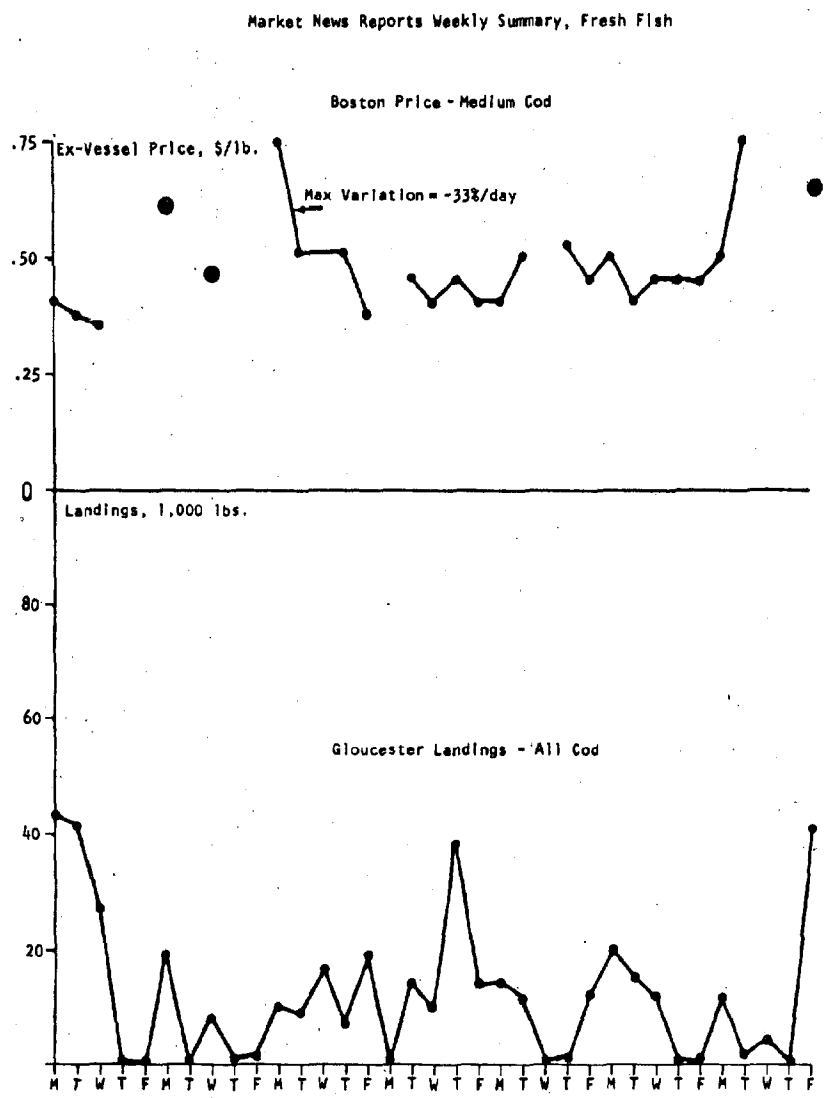

Monthly Unit Prices and Landings, Fresh Cod in New England
(Data from NMFS "Food Fish Market Review and Outlook";
Current Economic Analysis F-25; December, 1976)
3.00
2.00
1.00
Unit Price, $/lb.
and Monthly Landings
in Millions of lbs.
Price for Fresh Fillets
New England Landings
Ex-Vessel Price
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J
1974
1975
1976

FIGURE IV.4.2


Market News Reports Weekly Summary, Fresh Fish
Boston Price - Medium Cod
Ex-Vessel Price, $/lb.
Max Variation = -33%/day
.75
.50
.25
0
Landings, 1,000 lbs.
80
60
40
20
Gloucester Landings - All Cod
M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F

and from the Gross Crew Share is taken the cost of groceries and cook (if any) to give the Net Crew Share which is then divided equally among the crew (including the captain). The remaining 40% of the Net Stock goes to the vessel owner who must pay for various expenses. Table IV.4.1 gives a typical distribution for New England vessels. It should be noted that the terms "Highliner" and "Lowliner" refer to the highest and lowest earning vessels within a given port. The term "broken" is used to refer to a pre-arranged minimum payment to the crew in the event a trip is completely unsuccessful or terminated because of mechanical failure or some other reason (so-called broken trip).

Though young people do become fishermen, it is clear that the majority are older and more experienced and have come to fishing through family or ethnic connections. In 1972, for example, it was estimated that the average age of fishermen in New Bedford was 48, in Stonington 42, and in Point Judith 42, while the average age of captains of fishing vessels was 45 in Stonington, 42 in Point Judith, and 49 in Newport. In both Boston and New Bedford the average fisherman had attained less than a high school education. This is not dissimilar from the results of a study of commercial fishermen in Oregon, (1), where for the captain spending 85 or more days per year fishing, the age ranged from 45 to 55, years of education from 10 to 12, family size from 2.9 to 3.4 and total fishing experience from 16 to 24 years. It is also interesting to note that of this Oregon group 27% live at an average distance of 15 miles from their home port while the remaining 73% live in their home port.

---

(1) D. Lias and J. Stevens; "Oregon's Commercial Fisherman - Characteristics, Profits, and Income in 1972"; Oregon State University Sea Grant Program; July 1975.

Table IV.4.1

DISTRIBUTION OF TOTAL STOCK AVERAGES FOR 28 N.E. TRAWLERS

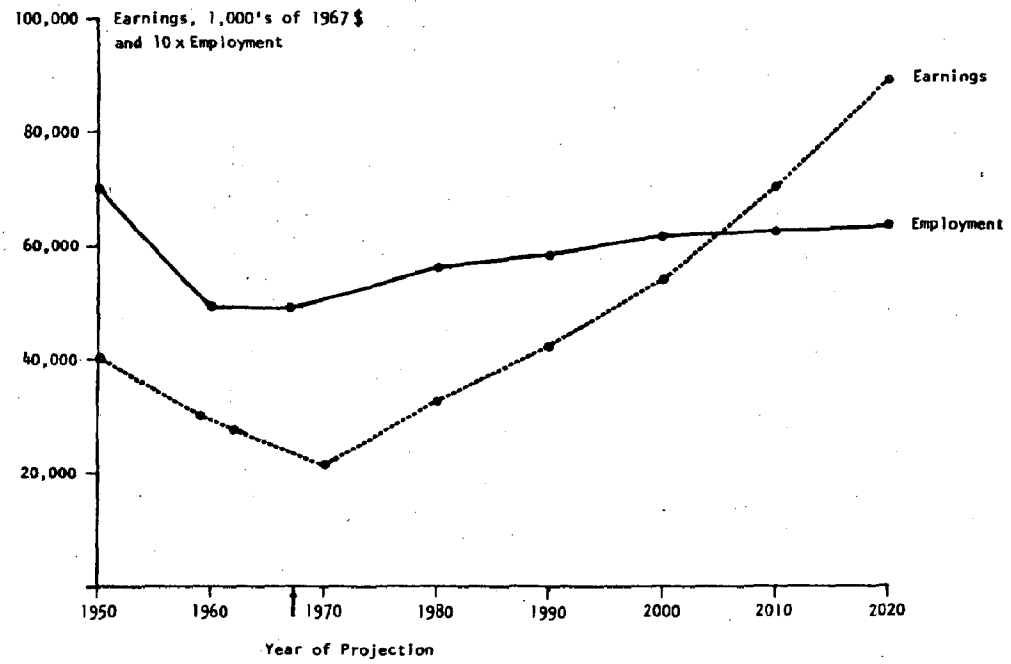
	Expenses	Lowliner	Highliner	Average
1.	Trip Expenses	21.2%	14.5%	17.9%
2.	Net Crew Share	46.5%	47.4%	46.9%
3.	Captain's Commission	3.3%	3.8%	3.6%
4.	Maintenance & Repair	8.0%	7.0%	7.5%
5.	Insurance	6.7%	5.3%	6.0%
6.	Payroll Taxes	1.7%	2.3%	2.0%
7.	Miscellaneous	3.0%	2.1%	2.5%
8.	Interest	1.5%	1.3%	1.4%
9.	Depreciation	7.8%	4.8%	6.3%
10.	Gear & Supplies	5.1%	5.2%	5.1%
	Total Receipts	$87,272	$86,366	$86,819
	Annual Income per Crewman	6,998	8,900	7,830
	Profit before taxes	-4,188	5,605	708

Source: "C. Hamlin and J.R. Ordway; "The Commercial Fisheries of Maine"; Maine Sea Grant Bulletin No. 5; Marine Advisory Service, NOAA Office of Sea Grant; Washington; 1974.

The real and projected earnings (in constant dollars) and employment in the categories of forestry and fisheries for the Bureau of Economic Affairs Region 004 (New Hampshire, Eastern Massachusetts and Rhode Island) are shown in Figure IV.4.3. These projections were made in 1967 and showed a fairly bleak outlook for both employment and income in these regional industries. According to this 10-year old projection, the employment level of 1953 would not be reached again until sometime well after the year 2000. As with any projection of this type, unforseen factors can throw them way off, and the enactment of the 200-mile limit may well have had that effect in the case at hand. Nonetheless, it is interesting to see these projections as an admittedly qualitative indication of where the industry has been headed. Whether that perceived trend continues or will be reversed by the 200-mile limit will be a matter of some study both at regional levels and at the Federal level.

FIGURE IV.4.3

Real and Projected Earnings (in constant 1967 dollars) and Employment in Forestry and Fisheries, BEA Region 004



IV. 5 Treaties and Quotas

Although the term harvesting is applied to marine resources, a major difference between land and sea harvesting is that the resources of the latter are of a common property nature. Without title to a specific portion of the resource the individual fisherman has little incentive to practice specific conservation and stock management. This duty has been undertaken by international agreements and national and state regulations. Until recently the United States was a member of the International Convention for the Northwest Atlantic Fisheries, (ICNAF). Formed in 1951, the Convention set quotas for various species and allocated these allowable catches among the member nations; for example in 1972 the quotas set for cod were: 20,650 tons to U. S. fishermen, 22,500 tons to Canadian fisheries; and 52,500 tons to other countries. The enforcement of these quotas was voluntary for the most part.

The signing into law of the Fishery Conservation and Management Act of 1976 made United States participation in ICNAF virtually impossible and in December of 1976 the U.S. withdrew. The Fishing Conservation and Management Act of 1976, also known as the Studds-Magneson Act or 200 Mile Act, provided for the creation of regional councils which will manage the fisheries of adjacent waters. The New England Region Preliminary Fishing Management Plan (PFMP) has been completed, and the PFMP quotas are shown with the 1975 landings and the old ICNAF quotas in Table IV.5.1.

Table IV.5.1

Quotas
(millions of pounds)

	U.S.			Foreign		
		Quotas			Quotas	
Species	1975 Landings	New* PFMP	Old ICNAF	1975 Landings	New* PFMP	Old ICNAF
Squid-illex	0.1	11.5	11.5	13.1	23.5	23.5
-lologio	1.6	25.0	25.0	31.0	19.0	19.0
Mackerel	7.6	19.0	4.7	277.2	69.0	249.3
Herring	36.6	18.0	18.0	144.6	22.0	48.6
Hake-Silver	12.9	29.0	29.0	91.7	85.5	85.5
-Red	2.1	9.1	9.1	26.2	34.9	34.9
Other Finfish	55.1	187.0	63.0	40.2	60.0	87.0
Haddock	16.2	6.2	4.5	NA	0.0	1.5
Cod	55.9	37.3	27.8	NA	0.0	15.2
Yellowtail	14.5	14.0	NA	NA	0.0	NA

*Proposed

As can be seen, the allowable catch for foreign nationals of haddock, cod, and yellowtail flounder have been eliminated under the new management plan and severe restrictions have been imposed in the case of mackerel and herring. Additionally, the management plan recognizes the importance of the recreational catch for which separate quotas (included in the above totals) have been set. The Management Council recognized the difficulty in tracking catch levels and, when quotas are reached, of enforcing a limit on recreational fishing, but hopes to solve this problem in the near future. Nonetheless, the passage into law of the Conservation and Management Act on 1 March 1977 marked a change in jurisdictional control of one of the world's richest groundfish areas, the Georges Bank. It also marks a milestone in the life of the New England fishing industry and the many small harbors of Massachusetts. It can be a major turning point for the industry and a major factor in revitalizing our small harbors.

Though the 200-mile limit law ended U.S. participation in ICNAF, our membership in the International Convention for the Conservation of Atlantic Tuna (ICCAT) remains in force and this convention is of great interest to New England fishermen in general and Massachusetts small boat fishermen in particular. Until the opening of the Japan export market this species was primarily of interest to recreational fishermen but now has significant importance to small boat commercial fishermen. Along with other migratory species, however, it is excluded from the 200-mile limit and the quota is set internationally by ICCAT and administered domestically by NMFS (the National Marine Fisheries Service). In 1977 the U.S. quota is set at 1850 fish for harpooners, anglers, and handliners. In addition, there is a bag limit of one fish per boat per day through August 14 and seven fish per boat per

week thereafter until the quota is reached. Because of the exceptional income potential from tuna and disagreement among biologists as to the size of the stock and the life cycle of the fish, this quota has been and probably will continue to be a source of great controversy.

Basically, the National Marine Fisheries Service and ICCAT have set the quota on the basis of a total fish population that has been estimated by means of a computer model of tuna life cycle. It depends heavily on the age distribution of fish that have been caught and the opponents of this analytical method, primarily representatives of the commercial interests, tend to claim that the method underestimates the total fish population because of both insufficient input data and faulty assumptions in the model itself, and that the resulting quotas are too low and do not permit American fishermen to take full advantage of a valuable resource. Proponents of the method include both NMFS and ICCAT and several sport fishing groups such as the International Game Fish Association, and their tendency is to claim that tuna is being overfished to the point where it may become an endangered species and that the quota should be reduced even further.

The consultant is in no position to endorse either point of view nor to take an advocacy position in any of the related sport versus commercial tuna fishing questions. Nonetheless, the current quota system for tuna highlights several questions that are or will become germane to other fisheries as well. Perhaps the most striking is the question of a common pool resource and the manner in which this characteristic of the resource affects its utilization. Each fisherman knows that there are 1850 fish out there that someone is going to catch. He knows with near certainty that those fish will be caught, i.e., the quota will be

reached, well before the natural migratory pattern of the fish takes them away from our shores. He also knows with near certainty that the value of the fish, price per pound, will increase as the season goes on, partly because of the artificial supply restriction imposed by the quota and partly because the fish is much more desirable in the Japanese sashimi market in the latter part of the summer when the fat content is higher. Due mainly to this latter point, the ex-vessel price of fish will be near zero (less than $0.30 per pound) in late June and early to mid-July and rise to over one dollar per pound and, in some years, two dollars per pound in August. Thus to maximize national and regional income and the aggregate income of all tuna fishermen, it is clear that fish should not be taken until August. Unfortunately, each fisherman has his own interests in mind and, not surprisingly, he would rather take a fish for $100 in June than let someone else take it for $1000 in August or September. Each fisherman further knows that even if he practices restraint early in the season, he has no assurance that others will do the same. In fact, he is fairly sure they won't and he's worried that they may reach the quota before he decides to enter the market. The net result is that everyone fishes merrily away regardless of price so long as it is sufficient to return a small profit over cost of fuel and bait.

Though the above speaks in terms of price alone and therefore seems to refer only to straight commercial fishermen, the same also applies to so-called sports fishermen as well. Sports tuna fishermen may restrict themselves to approved (by the rules of the tournament they are in or the organization they belong to) equipment and methods, nonetheless any fish they boat will end up

in exactly the same market as the "commercial" fish. Both owner-fishermen and charter boat operators count on this income to partially offset their expenses. Under the present quota system, a rod-and-reeler may do even more non-economic fishing than a commercial harpooner or handliner since he is primarily interested in the sport of fishing and can thus justify, to himself, fishing when the market value of fish is zero. Nonetheless, a fish that is caught for purposes of a record or tournament prize is just as surely removed from the stock and the quotas as one that is caught for a small profit.

The current quota system recognizes this to a point and also attempts to give sports fishermen and commercials alike a full season of three months. In the case of sports fishermen this is important to the income of the Commonwealth as a whole and to the communities that host the many out-of-state boats that come here for all or part of the season either individually or as part of tournaments. To continue to attract these boats and the many charter boat customers as well, there must be at least a chance of fighting and landing a fish. A straight numerical quota for the season would amost surely result in all of the fish being caught early in the season, to the detriment of both the full commercial interests and the sport interests. The one fish per day bag limit during June, July, and early August makes an attempt to spread the quota over the season, but it is the opinion of the consultant that this attempt is inadequate to the problem at hand.

There are many possible approaches to the problem, but many of the more novel approaches and potentially most effective in terms of resource management would tend to exacerbate the existing controversies even more. It

is the opinion of this consultant, however, that a simple change from the present seasonal quota to a series of monthly quotas would be in the best interests of both the purely commercial fishermen and of the sport or recreational fishermen as well. A quota of, for example, 10% of the total in June, 25% in July, 40% in August, and 25% in September would serve to stabilize and maximize the price for commercial interests and still maintain a full season for the sports interests. A part of this new system it would be also reasonable to add unused quotas to subsequent months and to modify the current weekly bag limit so that a boat could take no more than two or three of the seven fish on the same day. This new quota system admittedly does not speak to the controversy of what is the biologically determined maximum sustainable yield per season, but at least it would better allocate the seasonal quota of whatever level in the best interests of all concerned.

CHAPTER V: SMALL HARBOR DEVELOPMENT POSSIBILITIES

V.1 Harbor Development Interest Groups

Any development, whether an entirely new small harbor or just a half-dozen new houses, will offer benefits to some person or persons in the community and may involve disbenefits for someone else, though the disbenefits may be slight or so diffuse that they are not obvious. In a housing development, the beneficiaries are usually clear and well defined - the landowner, the developer/investor, the new owners or tenants, and possibly the municipality itself via increased tax revenues. Those who may be negatively impacted are also fairly well defined along with their possible disbenefits - abutters may be concerned about a lost or changed view, increased parking problems, or just a fear that neighborhood property values will be adversely affected; and the municipality itself may be negatively impacted by the need for increased services such as schools, sewers, sidewalks, or street lighting.

In a harbor development, however, the possible beneficiaries are much more numerous and their connection to the harbor may be much more tenuous. The same is also true of those who might be negatively impacted by a harbor development scheme. Those public officials charged with evaluating a proposed or potential harbor development will usually have to deal with a broad spectrum of both proponents and opponents, whether the development is entirely privately funded or is partially or fully funded from public sources. The prospects for ultimate implementation of a harbor development project in a small harbor will be greatly improved if the benefits and disbenefits of the project are carefully and fully reviewed early in the planning process.

Before examining this question for the model harbor and other typical Massachusetts harbors, there are a few general points to be made. It has been and continues to be our assumption that we are talking about development of or improvements to an existing harbor of some sort and are not concerned with the creation of an entirely new harbor. Massachusetts already has a well developed coastline, and it is simply not realistic to consider the creation of a new harbor on a "green field" site here. The largest development one might conceive in a Massachusetts harbor would be the establishment of a new marina or marina complex, but within the overall bounds of an existing natural or manmade harbor.

In the vast majority of cases, improvements to a channel or to the marking of a channel fall in the public domain. There are few cases where private ownership or responsibility extends beyond the low tide mark. (Some local authorities recognize private ownership of riverfront land to the midriver municipal boundary, but it appears that this may be in conflict with both state and federal conventions.) On the shore, however, ownership and responsibility can be either public or private or a mixture of the two. Likewise, investments and the decision to invest can follow a similar mixed pattern. Note that we are talking here of ownership or investment participation by public bodies and not simply regulatory intervention. Because of this possibility of public body participation in shoreside facilities, there is the possibility of the public agencies assisting private interests in some instances or being in direct economic competition with them in others. Because of this, it is clear that a given physical development plan could have quite a range of benefit/disbenefit patterns, depending on the degree and manner of public participation.

It is difficult if not impossible to list all potential beneficiaries of harbor development or those who might be detrimentally affected, but based on our discussions thus far it is possible to list those most likely to be affected and the types of developments that would affect them most for good or bad.

a) Commercial Fishermen

Almost any waterfront development will have some effect on commercial fishermen. Channel and navigational aids and other general boating services are perhaps more important to commercial fishermen than to any other group of harbor users, but there are also several other possible developments we have discussed that would be of direct interest and importance only to this group. We speak here of course of such facilities as unloading docks, cold storage, ice supplies, and so on. In this particular discussion we would include all offshore commercial fishermen in the same interest group, whether they fish seasonally or year-round, for finfish or offshore shellfish, and with whatever gear/vessel combination.

b) Clam and Mussel Harvesters

We separate clam and mussel harvesters from other commercial fishermen (including offshore shellfishermen) for two reasons. In the first place, they are likely to be pursuing their commercial activities within the confines of a harbor rather than just using the harbor as an operational base. Secondly, clam and mussel harvesters are directly affected by the water quality in the harbor since a moderately poor water quality can increase their costs through the required depuration. A grossly poor water

quality can even put them out of business as has happened in the study area. (As a final note about this group, we have used the term "harvesters" advisedly here, while still holding that the same term is inappropriate to offshore fishing which is more "hunting" than "harvesting.")

c) Party and Charter Boat Operators

This interest group is perhaps the conceptual bridge between offshore commercial fishermen and recreational boaters. In some cases a commercial boat will spend part of its time operating on charter or as a head boat, and even full time charter or party boats seek the same species on the same fishing grounds as the commercial boats. Shoreside, a party or charter boat doesn't need the same facilities as a commercial boat but rather facility needs are more similar to recreational boats. Charter and party boats deal with large numbers of people, so the convenience and attractiveness of the waterfront and the adjacent community are quite important. In fact, the interests of this group and full time commercial fishermen are sometimes in conflict in this regard.

d) Marinas

The term "marina" is used in its broadest sense here and includes both the full service marina complete with slips, moorings, fuel, restaurants, bait shop, marine hardware stores, and so on and a more limited marina which may consist of as little as a boat ramp, parking lot, and bait shop. Though there may be conflicts of interests among marinas, the more likely conflict will be between private marinas and public facilities such as a boat ramp or public

guest slips. The area where private marinas and public agencies are most likely to be complementary is the case where a public body builds a shoreside facility and then sells or leases it to a private operator or where a public agency creates a navigable area of water in a previously shallow or unstable area and then the adjacent private land becomes suitable for private marine development.

e) Bait, Tackle and Marine Hardware Stores

This interest group contains all of the marine oriented shops that are near the waterfront but have no marina facilities. This interest group is the least likely to be in conflict with other groups so long as the other groups do not advocate restraint of harbor use. Any increase in harbor use is good for this group. Contrast this with the marina group which would be opposed to increased use if the facilities are in public hands.

f) Recreational Fishermen

The recreational fishermen share many interests with commercial fishermen, and in a few instances their interests are identical, tuna fishing being the best example. The only areas of potential conflict onshore are in berthing, where a recreational boat would perhaps prefer not to share a berthing area with a commercial boat for aesthetic reasons. The main area of conflict for recreational fishermen, and this really applies to all boat owners, is with the marinas. Boat owners would prefer to see a proliferation of marina facilities in order to force down the price of the services they need. Free or very low fee public facilities are ideal from the boat owners point of view and disastrous

to the marinas.

g) Recreational Boaters and Sailors

This group has been separated from recreational fishermen mainly because their interest in the harbor is likely to be more aesthetic than the fishermen and more concerned with water quality in the harbor. Non-fishing powerboaters are especially concerned since their activities are likely to include swimming, waterskiing, or diving. Sailors are likely to have as strong an interest in channel maintenance and marking as commercial boats because of their keels, and they also have a great concern for bridges or any other channel constraints because of their masts and their relatively limited maneuverability.

h) Waterfront Restaurants and Bars

Waterfront eating and drinking establishments, whether they stand alone or are a part of a marina, depend heavily on the atmosphere of the harbor for much of their business. Though they undoubtedly draw business from the harbor user community, it is our subjective view that their main business is non-users who are drawn to the harbor by the general ambiance and the picturesque vistas. Because of this, this interest group would be in favor of just about any harbor development that increases activity in the harbor. The only qualification is that commercial fishing operations would probably be unwelcome as close waterfront neighbors mainly because of the smells and other non-aesthetic features of commercial fishing that may be picturesque at a distance but somewhat less so at close quarters.

i) Waterfront Businesses, Residences and Landowners

The businesses we refer to here are the non-marine businesses that just happen to be on the waterfront, perhaps for some historical reason that no longer applies. (In the study area, for example, there is a large hardware/lumber/heating business that used to deal in coal for home heating. The coal was received by schooner and barge well into the twentieth century.) These non-marine businesses are likely to be relatively indifferent to harbor development as long as their business is not directly impacted. Waterfront residents are likely to be less indifferent, since their waterfront view is an important part of the value of their property. Developments that improve their view are looked on as "good" while anything that obstructs their view or is otherwise aesthetically displeasing (such as a too close commercial fishing operation) is looked on as "bad."

A common concern of all non-marine waterfront landowners, whether businesses, residents, or owners of dormant land, is the possibility that their land may be re-zoned or even taken by eminent domain in conjunction with harbor development or that its value will be reduced because of nearby harbor development. On the positive side, the opposite could occur and non-marine or dormant waterfront land could substantially increase in value as the result of waterfront or harbor development.

j) Community Businesses

Non-marine and non-waterfront businesses in the community will generally benefit from any harbor or waterfront development that increases community

income and prosperity. The only possibility for this group to be negatively impacted would be if the commitment of local public funds causes an increase in local taxes that outweigh the benefits to these businesses of the increased commerce. Quite frankly, however, the public participation in such developments is usually through state and federal channels rather than local so this is rarely a problem.

k) The Community At Large

Until ten or fifteen years ago one might confidently predict that any development in a community would be fairly widely accepted as long as it would increase local income and job potential and would not show on the tax rate. With the advent of wide concern for the environment and for ecological matters, however, the reverse is frequently true and all developments are suspect *a priori*. This is especially true in the case of waterfront or shore developments for two reasons. On the environmental side, people have become aware that shoreline and waterfront are limited resources and there is a strong movement against any development that reduces the accessibility of these resources to the public at large. Conversely, developments that increase public access or make the waterfront more attractive in some way are likely to gain equally wide public support. Using the study area as an example, this is especially true in the case of waterfront that has a history of heavy use but has fallen into disuse and disrepair. On the ecological side, waterfront developments on relatively virgin sites are likely to encounter strong, though not necessarily wide, opposition because of the negative

impacts on waterfowl, fish, shellfish, or waterfront flora. In the study area, for example, there are waterfront areas that are heavily used by migratory birds and it is the opinion of this consultant that any attempt to develop those areas would meet almost insurmountable opposition on ecological grounds from both local interests and non-local interests.

This is not necessarily a complete list of those who might be positively or negatively affected by harbor development activities, but it does cover the major generic groups with a strong interest in a harbor and its development. Local officials considering harbor development via direct public funding or simply through licensing or zoning must carefully weigh the interests of all of these groups and attempt to act in such a way that the conflicts among the various groups are minimized insofar as possible.

V.2 Types of Developments

There are numerous types of improvements a local community might undertake or encourage to improve its harbor, and we can't possibly hope to list them all here. Nonetheless there are several types of developments that are obvious prime candidates for those harbors that lack them.

Some of the possible improvements are strictly in the public domain while others may be public, private, or a mixture of both. For each development possibility discussed we will touch briefly on how best to implement it and by whom. As we shall see, there are very few harbor projects that are strictly reserved to the private sector but many that are essentially prohibited to the private sector either by regulation or simply because of cost.

Funding possibilities for public developments are numerous and change from one year to the next. For major harbor developments, however, the source will almost surely be Federal, though the funds may move through a State or local conduit agency. Specific funding possibilities will be discussed in some detail in the next subchapter, but we will discuss here the various physical development possibilities that a small harbor community may wish to consider.

a) Harbor Entrance

Many small harbors, including and especially the Merrimac River harbor, have serious deficiencies or inadequacies at their entrances and these deficiencies limit the enjoyment of the harbor by recreational users and its usefulness to commercial interests. These limitations are imposed by the simple fact that the harbor entrance is unsafe at some tides, seasons, or weather conditions.

The physical possibilities for improving a harbor entrance will be very specific to the local characteristics, but a few observations have general applicability. If possible, the entrance should be passable to all craft that normally use the harbor, in all seasons and at all tides and weather conditions. Many small harbors, again the Newburyport/Salisbury harbor is a prime example, become inaccessible at precisely the time they are needed most to perform the prime function of a harbor - refuge during rough weather. In some cases, the physical characteristics of the harbor area simply preclude any manmade measures that could keep the entrance open in all circumstances or would require investment levels that are simply not economically justified. This determination is in the hands of the Corps of Engineers through its economic and technical studies, but local officials can participate to a degree by supplying the Corps with information concerning local economic impacts or with technical suggestions for improving the harbor mouth situation without necessarily curing it. In the instant case, for example, adequate marking of the ends of the entrance jetties would be a vast improvement over the current situation, yet at relatively low cost. Likewise, the results of this study show that the harbor has immense commercial importance that could conceivably justify river mouth improvement investment at a level well beyond what recreational usage alone could justify.

b) Harbor Channel

The natural forces that cause a channel to shoal or move, while still enormous, are more

amenable to manmade control than are the tidal, littoral, and storm forces that obtain at the entrance to a small harbor. Maintenance dredging on a regular basis is one way to keep a channel open and stable, but it can be expensive, perhaps even prohibitively so. A more permanent solution is sometimes possible through the construction of stone jetties or groins that restrict or redirect the water flow in critical areas and "train" the flow such that the increased flow velocity causes a scouring or self-dredging action.

As in the case of entrance improvements, however, channel improvements may be difficult to justify economically for purely recreational purposes, so an accurate and complete estimate of commercial impact should be made. If full corrective measures still cannot be justified, then less expensive remedial measures may be possible such as the placement of more or better channel markers, the removal or demolition of wrecks or other underwater obstructions that may be exacerbating shoaling, or more careful placement of new shoreside structures to assure that channel conditions will be improved or at least not worsened.

c) Basin Improvements

In the current context, the word basin is taken to mean those areas of a harbor that are not reserved for the free flow of traffic, i.e. the channel. Our use of basin does not just imply an expanse of relatively still water over a natural or manmade depression, but rather any of the water

areas of a harbor that have depth comparable to the channel and are available for anchorage, placement of moorings, maneuvering for and access to fixed or floating berths, and placement of slips.

Basin improvements can be funded entirely through private funds, in fact one small basin improvement is being done privately in the study area, but it is more common for basin projects of any significant size to be funded publicly, usually via Federal programs.

The public sector action in basin improvements is usually limited to three types of improvements. Dredging of a basin to create it from wetlands or very shallow flats is a quite common means of public action in this area and could be done by the Corps of Engineers or the state or municipality. This is a prime example of partnership between public and private entities, since the public agency creates or expands the usable water area and the private interests can then develop the shore areas to take advantage of the new water area.

The second type of public sector basin improvements is perimeter stabilization, the placement of structures or materials on or near the banks of a basin to strengthen and stabilize them. The usual impetus for perimeter stabilization is erosion prevention, but the structure used will almost always be of more direct benefit or use to shoreside landowners, whether marinas, residences, or any other use. Stabilization can take many forms, as simple as placing broken rock or riprap along the banks or as

complex as a pile supported concrete breakwater. The actual structure chosen will depend on local conditions and the severity of the erosion problem, but the benefit of such improvements for non-erosion purposes, i.e. to shoreside users, will generally be greater the more complex the structure.

There may be areas within a harbor that are suitable for navigation and refuge from severe weather but are less than ideal for moorings or floating slips because they are especially susceptible to wave action due to their orientation or location within the harbor. Such areas are candidates for the third major type of basin improvements, wave deflectors or attenuators. These may be either fixed structures or any of several types of floating devices. Wave attenuators or deflectors within a harbor differ in both form and function from the jetties and breakwaters that are built to create a harbor or protect its mouth.

Jetties and breakwaters are generally much more massive structures than attenuators. For example, jetties and breakwaters are usually built from granite blocks on concrete tetrapods (interlocking manmade concrete forms that resemble children's jacks but with four legs instead of six) weighing many tons each, while a wave attenuator may be nothing more than a floating log or drum boom, a floating raft of old automobile tires, or even a submerged hose that sends up a curtain of air bubbles that can attenuate a wave by virtue of their compressibility. Functionally, a jetty or breakwater must be able to

absorb the full energy of ocean waves generated by wind, tide, and current. Harbor wave attenuators may only have to redirect waves of much less severity. Breakwaters and jetties face deep water breaking waves caused by tides and storms, while wave attenuators face shallow water non-breaking waves from any of several sources including the wakes of boats in the channel. Whatever the source of waves, however, and whatever the form of wave attenuator selected, such improvements can markedly affect the suitability of a basin for boating use.

d) Seawalls and Bulkheads

Seawalls and bulkheads are in fact perimeter stabilization structures, but we differentiate them here because they are also overtly intended to improve or develop the shoreside land. As such, they are usually implemented by the landowner as part of the land development scheme, whether the landowner is a public entity or private interests. In the Merrimac, for example, the bulkhead that is currently under construction in Newburyport is entirely publicly funded in conjunction with the waterfront park development.

Functionally, a bulkhead differs from a perimeter stabilization project in that the latter is intended primarily to prevent natural erosion processes while the former is a load bearing structure whose design is based on the nature of the activities it must support. For erosion prevention only, a perimeter structure might consist only of concrete blocks laid like interlocking tiles over a sloping

shoreline. If the intended use of the shoreside land is an apron for a boat stocking facility, then a piled bulkhead would be needed both to support the live load of a loaded forklift truck and to assume sufficiently deep water immediately adjacent to the apron.

e) Bridges

Though bridges are not really harbor developments or improvements but rather highway improvements, it is clear that bridges can have a substantial effect on the operation and use of the waters they span. Fixed span bridges permanently limit the height of boat that can pass, and any bridge limits the width of boats that can pass. Draw bridges do not physically limit the height of boat that can pass, but boats must take a little more time to pass the bridge while awaiting the opening of the draw and, if the road the bridge services is a busy one, the bridge openings may be restricted to off-peak hours which will reduce the use flexibility of the waterway for boats that need high clearance.

Sailboats and large power boats with masts, antennas, and/or tuna towers are the craft most directly affected by bridges over harbor waters but even smaller boats are affected to a degree. Bridge abutments restrict the channel width and may affect current flow enough to make passage difficult or potentially dangerous even for small boats. Likewise, abutments or any other fixed structures in or near a channel are always potential hazards to boats, especially at night or under other conditions of

of limited visibility. Such structures are doubly hazardous because their effects on the current and the fact that they usually form dangerous eddies usually requires that a boat pass them at relatively high speed to maintain steerage. For related reasons, bridges usually consume much more basin area than the physical area they occupy since the area near them is not suitable for mooring, anchoring, or cruising or maneuvering.

When considering a new bridge or a replacement or modification to an existing structure, local authorities and the relevant state and Federal authorities must achieve a balance between cost and the competing needs of road traffic and waterborne traffic. It must be realized, however, that any restriction on waterborne traffic will affect the harbor use pattern. As an example, the bridges across the Merrimac are a highway draw bridge that can pass a boat of any height and a swing span railroad bridge that is permanently open and thus also presents no height restriction. Both bridges have width restrictions of course, but they present no physical barrier to any boat that uses the harbor. Nonetheless, a survey of the harbor and aerial photos clearly show that there are very few sailboats or large power boats that moor or berth upriver of these bridges.

f) Ice Protection

As we have noted, ice presents problems in a harbor in two ways. Ice in still waters can damage boats by cracking their hulls and fixed structures by raising pilings. Moving floe ice or sheet ice

causes damage by impact or by an abrasive cutting action. Protection from the former is strictly a private interest matter and involves installing bubbler hoses under each slip.

Moving ice, on the other hand, requires the use of fairly massive ice deflectors which may be placed by public agencies, private interests, or a combination of the two. Ice deflectors may be fixed or floating and their extent will depend on local conditions and the amount of area that needs protection. Whatever type of structure one uses, it must deflect the ice but not stop or trap it, since ice that is only stopped or trapped will be there until the next thaw, and other ice will build up over and around it in the meantime. In the Merrimac, for example, an ice deflector of any length should be set at some angle to the current flow or else it would have to be massive enough to take the impact of floes weighing several tons and moving at three to four knots and be able to take such impacts repeatedly over a two to three month season.

There are several forms a fixed ice deflector might take. A granite block abutment or jetty is the most durable, but heavily piled structures can be equally effective. The piled structure may be one or a series of dolphins, five to ten wooden piles driven close to each other in tepee fashion; it may be a pile supported wooden crib containing granite blocks or rubble; or it may simply be the piles supporting a pier or other waterfront structure, increased in size or number for ice protection. A heavy

log boom or raft can serve as a very effective floating ice deflector as can a used steel or wooden barge, but either type of floating deflector requires solid and secure moorings to take the ice impacts, especially at the offshore end.

In harbors with a reversing current and ice movement, such as the Merrimac, some ice protection may be required on the downstream side as well, though the ice that moves upriver on a tidal flood is likely to be less massive than downriver ice on the ebb. One approach that solves this problem directly is the construction of an embayment, a cul-de-sac in the shoreline that permits berthing boats out of the current and ice flow. The only physical constraints on such an embayment are that its opening width should not be large enough to permit eddy currents to carry ice into it and that there be enough water movement in and through the embayment to prevent the formation of still water ice.

g) Docks and Floats

New docks or other fixed waterfront structures require approval of both state agencies and the Corps of Engineers, but local regulatory authority can also be exercised through the harbormaster, zoning laws, or a conservation commission. A dock may be built either by private or public interests or a combination of the two. The design type and size of docks and their associated floats will depend entirely on local site conditions, the purpose of the structure, and the available resources, so we can offer only the most general comments on docks and floats here.

If the shoreline is relatively steep and near deep water, such as one might find on the outside of a river bend, then the dock itself will generally begin with a marginal structure that essentially serves as the interface between the marina yard level and the water. This marginal structure may be a rather simple pile supported deck if the shoreline is naturally stable or it may require a bulkhead, a steel cell structure, or some other structure with both lateral and vertical strength if the shoreline needs stabilization. The actual bearing strength of the marginal pier will depend on its intended use, but it would be prudent to design for the largest load the dock might see even if such a load is beyond the intended use of the structure. For example, a dock intended only for personnel and gear should nonetheless be designed for light truck loading if it is accessible to trucks, since the likelihood of a truck being driven on the dock is quite high.

Pile type and placement method will depend on the specific design and the piles may be either wood, steel, or any of several types of concrete piles. Wood piles are usually the most economical around here, but they should be pressure treated with a preservative and anti-foulant. As a further precaution against dry rot, timber piles should be equipped with sheet metal or plastic caps or cut at an angle. If one of these precautions is not taken, fresh water could accumulate on the pile top and allow dry rot to attack the core of the pile. Piles may be driven into the bottom or, if the bottom is relatively soft, the piles can be placed with the assistance of a water

jet. Round wood piles are normally driven butt end, i.e. large end, up but if the dock is in an area susceptible to still water ice, the piles should be placed butt end down so that the taper will not contribute to ice uplift.

The pier deck may be either timber or concrete and, again, funds availability will usually be the deciding factor, but if timber is used, it should be treated timber if at all possible to minimize dry rot (an algae-caused condition in wood exposed to a fresh water environment such as accumulated rainwater). It is not uncommon for docks that have been unused and unmaintained for a number of years to have badly rotted decking and stringers over still sound piles. Piece by piece removal and replacement of rotted timbers may prove to be quite expensive, but a novel but workable alternative is to simply patch all the holes in the deck with plywood, and pour a new concrete deck of three to six inches over the old wood deck, in effect using the old deck as a left-in-place form for the new concrete deck.

If the shoreline is on the shallow side of a river with a gently sloping bottom, then the first structure needed will be a finger pier extending out from the shore to water deep enough for the berths being serviced. It will almost surely be an open piled structure to allow free flow of water through it but, because of its long and narrow form, the underpinnings should be cross-braced for torsional rigidity.

The height of either type of fixed structure should be at least two feet above extreme high water and of course either type of structure will need floating piers and ramps to access the boats. Both ramps and floats should be wide enough for two-way traffic and should have non-skid surfaces for safety. Ramps should always have handrails for safety but floats usually don't because rails would limit access to the boats. In areas where wakes and waves cause excessive float motion, however, the floats should be made extra wide to allow safe passage of two-way pedestrian traffic. There are a large number of possibilities for flotation systems and decks for floats such as wood decking over boom logs, wood decking over oil drum floats, all plastic floats with integral flotation chambers, the same with ballast chambers, concrete floats, etc. Whatever system is chosen, however, it will require some type of anchor system to hold the floats in position against wind and current.

In a river environment with light and unidirectional (non-reversing) current, shore based anchors may suffice. More usually, however, the floats are anchored via piles in the harbor bottom and are equipped with some device that permits easy vertical movement on the piles with tide changes. Depending on the size of boats to be berthed and the anticipated lateral loads, the piles may be rather heavy timber piles or rather light galvanized steel pipe. The latter are exceptionally easy to place by using the pipe itself as a water jet. A simple ring or traveling iron will suffice in either case for vertical movement, but a set of rollers that surround the pile

or pipe will prevent abrasion and be more quiet as the floats are moved by waves.

Usually, the busiest part of any marina is the fuel dock and it would be prudent to add an extra float at the fuel dock so that the fueling berth is set out from the other slips and is made as easy as possible to approach. The fuel dock should also be equipped with extra fenders in recognition of the fact that it is a high traffic area and is unfamiliar territory to many customers.

CHAPTER VI: LOCAL HISTORY

The area around what is now Newburyport and Salisbury was first seen by English explorers early in the seventeenth century. As early as 1605, Samuel de Champlain mapped the area of the mouth of the Merrimac with the assistance of the natives who then lived there. Newbury, from which Newburyport later seceded, was founded and named as a settlement in 1635, though the Merrimac was frequently visited and fish taken much earlier than that. William Ward, writing of what is now Salem in "New England's Prospect" in 1634 said,

> ". . . In a word, it is the best place but one, which is MERRIMACKE, lying 8 miles beyond it, where, is a river 20 leagues navigable: all along the river side is fresh Marshes, in some places 3 miles broad. In this river is Sturgeon, Sammon, and Basse, and divers other kinds of fish. To conclude, the Countrie hath not that which this place cannot yield."

The fishing in the area was obviously fairly good at that time since, as Ward further notes,

> "The sturgeons be all over the Countrey, but the best catching of them be upon the choales of Cape Codde and in the River of Merrimacke where much is taken, pickled and brought for England, some of them be 12, 14, 18 foote long."

The catching and curing of sturgeon continued to be an important local industry and the product was shipped both to London and to other New England colonies. By 1673, the first concerns about conservation arose and the General Court saw fit to authorize counties "to license able and fitt persons to boyle and pickle sturgeon for sale". Salmon were also quite plentiful at the time, and in fact so plentiful that apprentices traditionally stipulated in their articles of agreement with their employers, who provided their food and clothing, that

they should not be compelled to eat salmon more than three times per week. By the close of the seventeenth century, however, both salmon and sturgeon were becoming more scarce and more a luxury food than an inexpensive staple for apprentices; and by February 28, 1765, the General Court found it necessary to pass "an act to prevent the destruction of salmon and other fish in Merrimack river". Bass were similarly protected in 1771, though apparently both laws were honored mainly by being ignored.

Commercial fishing in the Merrimac itself gradually decreased due to overfishing, the increasing pollution that interferred with spawning, and the erection of dams at Lowell and Lawrence that also interferred with spawning habits. The last commercial catch of sturgeon was two tons in one week in August of 1887, though a single 230 pound fish was taken near Carr's Island in herring nets in 1938. Attempts were made to restock salmon in the latter part of the nineteenth century, but pollution and poaching combined to thwart those efforts, and by 1900 the salmon fishery was completely wiped out. By the early nineteenth century, the inshore fishery was substantially reduced but the role of the harbor as an offshore fishing base and a center of commercial and shipping activities was still quite significant. The offshore fishing fleet probably reached its peak around 1834 when the fleet consisted of some 140 vessels employing 1000 to 1500 men, but by 1851 the industry was already in decline and the fleet had dropped to 90 vessels employing 985 men, and by 1912 only some 200 men were employed in the industry.

Undoubtedly, many of the vessels were built in this area since shipbuilding was a prosperous business as early as the mid-seventeenth century. Though shipbuild-

ing in the area reached its peak in the decades immediately before and after the Revolution in terms of number of yards and vessels built, the zenith of shipbuilding in a more poetic sense probably coincided with the clipper ship era around the mid-nineteenth century. Prior to the Revolution, many ships built in Newburyport were for British owners but many also were owned, crewed, and captained by local men. It has been noted that the "independent nature" of these local owners caused them to resent (and therefore evade!) British taxes and this resentment carried over to the war itself when some 60 or more privateers operated out of the Merrimac. After the war, the local concern for taxation took a somewhat ironic turn when a Newburyport shipyard built the revenue cutter Massachusetts, the first vessel assigned by the new American government to collect customs duties, and thus the U. S. Coast Guard traces its birth to Newburyport in 1791. In 1811, the port and downtown areas were destroyed by the first of several major fires that have struck Newburyport over the years; and when the downtown area was rebuilt it was done in brick, and firewalls were placed between adjacent buildings extending above the roofs in what is still a characteristic of the restored architecture of the central business district.

As noted earlier, the poetic zenith of local sea commerce and shipbuilding occurred with the construction and operation of the clippers in the mid-nineteenth century, but the industry was in decline with the coming of steam and the iron-hulled vessels. The last square-rigged vessel to be built in Massachusetts was launched in Newburyport in 1883 and the last schooner was built here in 1901.

Steamers, schooners, and ferry boats continued to call at the Merrimac well into the twentieth century but the port was clearly in decline as a commercial center and a fishing harbor and those ships that did call here were primarily carrying coal or lumber, or passengers, on short domestic routes.

Throughout the first half of this century, the area has been characterized by factory-based local economies and was a minor commerce center by virtue of its convenient location on the main rail and road routes to New Hampshire and Maine. With the mass exodus of factories out of New England in the fifties, the area moved into a period of economic decline and began to take on more of the atmosphere of a Boston suburb, but at a slower rate than many of the communities closer to Boston. It is somewhat remarkable that the population of Newburyport stayed almost constant at about 14,000 from the Civil War through the 1950's and only in the past 15-20 years, coinciding with the urban renewal era, has it moved significantly upward to its current level of about 16,000.

By the late 1950's the City and the adjacent towns were in a severe economic recession with high and chronic unemployment and, in the case of Newburyport, a badly declining central business district. In recognition of the need for revival in the CBD, the City established the Newburyport Redevelopment Authority in 1960 and an urban renewal area of some 22 acres, encompassing much of the commercial area of the central business district and the adjoining Merrimac River waterfront area. The initial urban renewal plan called for wholesale demolition of much of the downtown area and replacement with contemporary structures and extensive parking areas. Though some buildings were in fact demolished, increasing

public reaction to the destruction of this historic area of the City eventually called a halt to the initial plan and a re-examination of the whole renewal concept.

Among other steps, the entire Market Square area, the historical and current center of the commercial area, was placed on the National Register of Historic Places in 1971 as the Market Square Historic District. Included in this area are the Central Fire Station (built as the central market building in 1823) and the former U. S. Custom House (1835) which had fallen into complete disrepair and was being used as a warehouse for junk but has since been fully restored as a maritime museum. In 1970, the entire concept of demolition was dropped in favor of rehabilitation, a process which is now nearing completion. The Inn Street/Market Square renewal area has won architectural awards and national recognition as one of the most successful undertakings of its kind. The rehabilitation of the downtown area has preserved some of the finest examples of Federalist commercial architecture in the country and has caused a major economic resurgence in the central business district.

It is of major significance to this study that the rehabilitated downtown area is within easy walking distance of nearly all commercial fishing activities in Newburyport and within sight of all commercial and recreational boating activities in Salisbury. In spite of this proximity, however, the waterfronts of both communities have been relatively unchanged by the major renewal in Newburyport, with the exception of that part of the Newburyport waterfront that is within the urban renewal area.

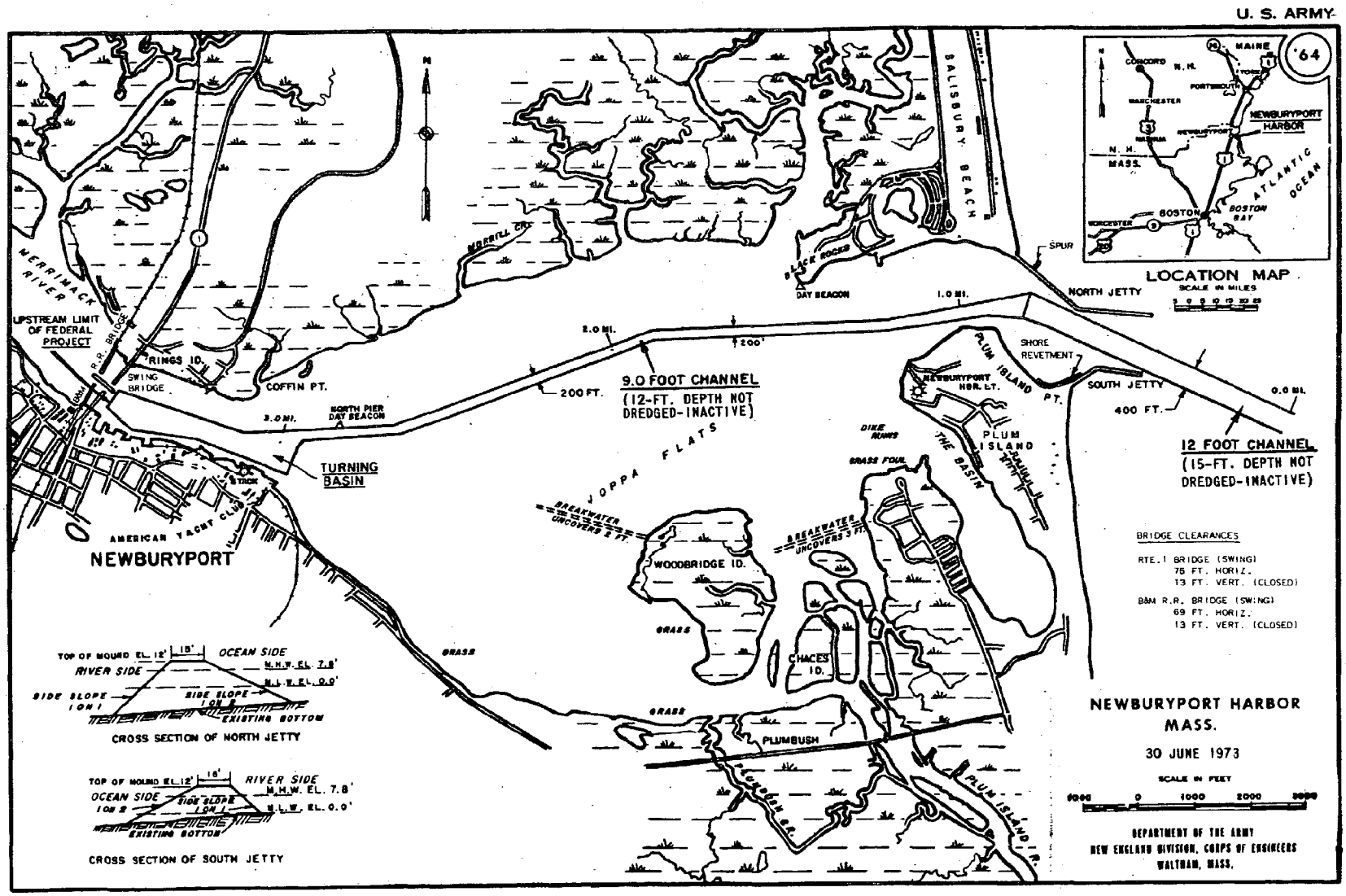


Figure VII.1.1 Newburyport/Salisbury Harbor

CHAPTER VII: CURRENT STATUS OF THE HARBOR AREA

V11.1 The Harbor Itself

The Newburyport/Salisbury common harbor is located near the mouth of the Merrimac River, the largest river in eastern Massachusetts. The two communities and their shared harbor are on the northernmost part of the Massachusetts coastline and Salisbury is the northernmost community in the Commonwealth. Figure V11.1.1 is a U.S. Army Corps of Engineers map that shows the general configuration of the harbor and the location of the two communities on the Massachusetts coastline (This map is dated 30 June 1973 but inexplicably it does not show either Route 128, Route 95, or Route 495. Our assumption is that it was not originally prepared in 1973 but is simply a reissue of a much older map).

In common with most river mouths, the Merrimac mouth consists primarily of wide expanses of very shallow intertidal flats and salt marshes with only a very narrow natural channel. This channel is shown on the Corps map as being twelve feet at the bar and nine feet within the harbor itself, with a channel width within the harbor of 200 feet. The Coastal Pilot, on the other hand, shows the harbor having a controlling depth of 8.5 feet at the bar and 6 feet from the bar to the main harbor area near downtown Newburyport. These latter figures are more nearly correct in describing the actual situation at low tide,

and the channel is also subject to some shifting and shoaling as well so the safe effective width at very low tides is actually a good deal less than the nominal 200 feet. On the more positive side, detailed soundings of the harbor bottom by the Corps in 1974 indicated that the inner harbor, the area west of the "north pier day beacon" on the map of Figure V11.1.1 has depths substantially greater than the indicated nine feet.

The tidal range in the Merrimac is approximately eight feet and currents can be as high as three knots on the flood tide and in excess of three knots on the ebb. Because of the tide range and the currents, ground tackle for the many fixed moorings in the harbor must be exceptionally heavy relative to "quieter" harbors and the same is true of the fixed and floating shoreside installations. The climate of the area is generally similar to the rest of eastern Massachusetts and southern New Hampshire and Maine, with a mean daily temperature ranging from the low to mid 30's in January to the low 80's in July/August. Precipitation is relatively uniform througout the year, with a trace or more precipitation approximately 130 days per year. Predominant winds are from the NW quandrant except during the summer months when the SW quandrant predominates. On an annual basis, wind speeds in excess of 15 knots occur 36% of the time and the recurrence interval for moderate to severe damage producing storms is 0.8 years. The 10 year extreme wind is estimated at 70 mph and the 100 year extreme wind at 95 mph. All of the above information is taken from the environmental impact statement

for the nuclear power plant being built in nearby Seabrook, N.H.; but, in the opinion of the consultant, the figures do not adequately reflect some of the extremes that can regularly occur in winter.

For example, the mouth of the Merrimac and the entire Massachusetts coastline north of Cape Ann are completely exposed to the northeast. A comparison with the rest of the U.S. Atlantic coast shows this to be the most exposed section of coastline, to the northeast, of any area north of Cape Hatteras. The usual pattern of winter low pressure areas in the U.S. carries them up from the south central part of the country towards New England on a storm track that takes them offshore near the Massachusetts coast. The resulting northeast wind can cause severe seas in the area and/or much heavier local precipitation than in other coastal areas just a few miles to the north or south. Such a northeasterly or easterly blow coupled with an outgoing tide near its ebb can cause conditions at the shallow mouth of the river that make it all but impassable.

During the summer months the harbor channel and the seaward approach to the harbor are moderately well marked by a series of lighted and unlighted buoys, land-based lights, and day beacons. The most serious shortcoming in the navigational aids system is the lack of any marking at all on the ends of the two jetties that form the river entrance. In particular, the north jetty presents a very low profile at high tide and during very high tides and/or heavy seas the outer end

of the jetty may even be partially or completely submerged. In winter, some of the buoys are removed from the channel to avoid ice damage and the channel becomes extremely hazardous in nearly all conditions even for the commercial fishermen who are most familiar with it.

The Newburyport/Salisbury area has seven private marinas which have slip space available for approximately 200 boats and moorings for 125-150 additional boats. Slip fees, usually including limited electric service and fresh water, are generally in the range of $15-20 per boat foot per season and moorings generally rent $150-200 per season. Most of the marinas provide tender service along with the moorings. There are two local clubs, the American Yacht Club and the North End Boat Club, and between them they provide about 20 additional slips and 150-175 additional moorings. All of the marinas and clubs are at or near capacity and the general consensus is that the demand for slips and moorings exceeds the available supply, though no figures are available to quantitatively support this.

Among the marinas and the several non-marina bait shops, tackle shops, marine hardware stores, and related businesses nearly all services normally desired by recreational boaters and fishermen are readily available. This includes nearly all of the needs outlined in Chapter III of this volume. These services are heavily concentrated on the Newburyport side as are the auxiliary services such as general shopping, tourist activities, and restaurants and bars. The Salisbury waterfront is several

miles from the center of town and the Salisbury Beach resort area and amusement center. One of the major deficiencies of the area around the harbor is the total lack of accomodations for visiting recreational fishermen or other tourists. Newburyport has no motel or hotel space and, though Salisbury has many hotels and motels as well as both public and private trailer and campsites, they are all concentrated in the beach area and do not really service the harbor.

Neither town has any commercial fishing support facilities in the public domain, though marinas in both communities provide rudimentary unloading capabilities to commercial fishermen using facilities that are primarily oriented toward recreational boaters. Diesel oil is available from some marinas, though many commercial fishermen buy No. 2 fuel oil from home heating dealers because of the lower price. Large quantities of bait are not readily available nor is fish ice available in the harbor itself. There are no extensive ice-free mooring or slip areas in the harbor, though marginally ice-free slips for about five vessels exist at one of the marinas on the Newburyport side.

The two sides of the river are connected by a pair of drawbridges, one for the vehicular traffic and the other a railroad bridge. The railroad right of way has been unused for a number of years and is all but abandoned so the railroad drawbridge is permanently open. (The railroad has expressed a desire to dismantle this bridge but both of the local communities and local and

state officials in New Hampshire and Maine have resisted this proposal in the hope that coastal rail service may someday be restored). The highway bridge has an opening of 80 feet over the river channel and a clear height of 35 feet above mean high water. For sailboats and others with above water heights in excess of this, the bridge is manned and available for opening on a demand basis from 6 AM to 10 PM. There are several marinas and clubs upriver of this bridge and in the past year it was one of the busiest bridges in the Commonwealth in number of openings.

At present the river is heavily polluted with both industrial and sanitary wastes, though many of the sources of pollution are in the process of being removed or corrected under a variety of federal laws and programs as well as under the initiatives of the states of Massachusetts and New Hampshire. Locally, the most serious sources of pollution, and the main reasons for the continued closure of the rich clam beds of the Merrimac, are the untreated sewage discharges from Salisbury and the inadequately treated discharges from Newburyport. Both of these sources of pollution are in the process of being corrected with the assistance of State and Federal grants and the indications are that clam harvesting will be permitted, with subsequent treatment, in a matter of two years or so. (There are about 220 acres of clam flats on the Salisbury side and about 645 acres on the Newburyport side, of which 115 acres are in the Town of Newbury).

VII.2 Recreational Harbor Users

Throughout this report we have tended to tacitly group all harbor users in two general categories - comercial fishermen and recreational boaters. While this is a fairly good first approximation, there are many variations within these two broad generic groups, and a more detailed look at the harbor users will perhaps serve to underscore the value and importance of this harbor or any small harbor to the community it serves. This review of the various user groups can also serve to highlight those features of the harbor that are most important to the various harbor interests.

On the recreational side, we must begin with the unfortunate fact of life that the Merrimac at present holds little or no attraction for in-water sports such as waterskiing or swimming because of the poor water quality. There are sandy beach areas on both sides near the mouth but, though a few people occasionally swim on a rising tide (when the inflow of ocean water prevents or reduces the downriver flow of polluted river water), these two sandy areas are used mainly for strolling and, especially on the Newburyport side, by surf-casting fishermen.

The main recreational uses of the river are sailing, cruising, and fishing and the popularity of these activities is especially obvious on a warm summer weekend when

the channel itself and the favorite fishing grounds near the channel can develop the aquatic equivalent of a traffic jam. The smaller boats, outboards, and other small motor boats, can roam rather freely in the harbor during most of the tidal cycle; but the larger cabin cruisers and sports fishermen have to constrain themselves to the channel or known deep areas outside the channel during much of the tidal cycle because of their draft. Most sailboats have some type of keel, daggerboard, or deep rudder, so even the smaller sailboats are rather constrained in their movements as well. The generally heavy traffic and the constraints on the deeper draft boats can make some of the critical points in the channel difficult or even dangerous to navigate on weekends. In particular, the area just to the north of Plum Island Point (near the 1.0 mile mark of the channel in Figure VII.1.1) combines a narrow and dangerous part of the channel with a favorite fishing spot (with lots of small boats on anchor) to present a real navigational challenge, especially to a moderately large sailboat.

There are many possible divisions among the recreational boaters, but sail and power seem the most obvious first division and among the power boats, the next division would be fishermen versus non-fishermen but there are very few who don't fish at all. Rather, there are avid fishermen and occasional fishermen who are primarily interested in cruising and sightseeing. Fishing in and near the Merrimac ranges from good to excellent and both locals and out-of-town visitors fish for striped bass, flounder,

bluefish, and mackerel in the river and immediately outside. In the nearby ocean ther are cod, haddock, flounder, and other bottom fish as well as blues, stripers, and giant bluefin tuna. Many small boat fishermen rarely if ever go outside the river, in part because of caution about the river mouth, but others regularly fish outside. Some of the more dedicated fishermen even fish at night, a somewhat hazardous practice since the favored fishing areas seem to be concentrated near the channel both in the harbor and between the jetties, and a small boat on anchor is not readily visible to a large fishing boat returning late from a day trip.

The larger privately owned boats regularly steam from the Merrimac to deepsea fishing grounds for bluefish, tuna, or the larger bottom fish on all day trips. Some of the more popular areas for Merrimac-based boats are the northwest corner of Stellwagen Bank (a 2½ to 3½ hour trip one way), Halibut Point (1 to 1½ hours), or Jeffrey's Ledge (1½ to 2 hours). Stellwagen (or Middle Bank as it is also called) is generally frequented by tuna fishermen as well as people after bluefish or bottom fish.

Many locals and visitors charter boats with captain and crew for all day trips for the same species and there is a large and active market in the area for head boats or party boats. A large percentage of the party boat business is repeat business with some anglers going out

on the same boat week after week. Much of this business is non-local so it represents a significant addition to local income.

Though most of the recreational boaters who fish are doing so only for the fun of it and for the sake of an extra meal of fresh fish for themselves or the neighbors, there are also many who, though primarily recreational, are successful enough to be able to sell some fish to local dealers to at least partially offset some of their boat expenses. Sports tuna fishermen of course always plan to sell their catch and it is in these areas that the line between recreational boaters and commercial fishermen becomes somewhat unclear. For the purposes of this study we have decided to assume a fisherman is commercial if he depends on fishing for all or a significant part of his income for at least a part of the year. Thus, the person who occasionally sells the catch is not considered commerical nor is the person who regularly sells the catch i.e. tuna fishermen, but only to offset expenses and with no realistic expectation of a net financial gain from fishing.

The final category of recreational harbor users are the people who never or rarely get on a boat. These are the people who enjoy walking along the water, seeing the boats coming and going, watching sailing races, having a drink or a meal at a waterfront restaurant or bar, or simply being near a center

of waterfront activity. To such people the continued vitality of the harbor can be as important to the overall quality of life in the community as it is to the avid fisherman who goes out several times per week.

VII.3 Commercial Fishing

Commercial fishing is an active year round business in both Newburyport and Salisbury but the size of the fleet, the number of persons employed, and the economic importance of the industry varies markedly from one season to the next. In addition to the usual annual cycles of the business as a whole, individual persons and boats are constantly moving in and out of the commercial fishing business or changing the manner in which they participate. Becuase of this continually changing nature of the fleet and the workforce, it is difficult to summarize the main characteristics of commercial fishing in the Merrimac or in any other small harbor. Indeed, the most prominent characteristic is that the business remains in a constant state of flux.

The fleet itself generally consists of small and old boats. Most boats are in the range of 25-45 feet in length and the majority are over 15 years old. There are a few boats that are larger and some that are newer, but they are the exception rather than the rule. Though most of the boats in the fleet were originally built as fishing boats, there are also several vessels that have been converted from cabin cruisers or sports fishermen and at least one boat that was formerly a workboat serving the offshore drilling industry.

Because of their size, most boats in the Merrimac fleet operate in waters near their home port. For reasons of economy and safety, they rarely operate more than three to four hours steaming time from the Merrimac and most try to stay even closer than that. The most popular groundfish area for the Merrimac fleet is Jeffrey's Ledge,

located some 20 nautical miles due east, but the local fleet also fishes Stellwagen and several other shoals and banks in the Gulf of Maine. With the exception of the largest boats, the local boats tend to fish on one day or, occasionally, two day trips. The only deviation from this usual pattern is when a Newburyport or Salisbury boat overnights for one or a few nights at some other port because of weather or the location of the fish at that time. In summer, for example, many local boats operate out of Provincetown for periods of a few days to two or three weeks when the tuna are more active down there than nearer the home port. Likewise, boats from Newburyport/Salisbury frequently spend periods of up to two weeks operating out of Gloucester, commuting by car to their homes each day, in order to save steaming time.

The Merrimac boats are small enough that most can be adequately crewed by two or three people and many of the smaller boats can be worked singlehandedly. Even on those boats that regularly carry a crew of three or four, the larger crew is usually a matter of preference and convenience than absolute necessity. Very few boats operate with the same captain and crew all the time. Instead, the captain/owner may have a semi-formal agreement with one or two people as his semi-permanent crew plus several less formal understandings with others who fill in when the semi-permanent crew is unavailable for one reason or another. These arrangements are possible because such a large percentage of those engaged in the small boat fishery of the Merrimac are not full-time,

year-round fishermen. Many hold full-time, year-round jobs shoreside and only fish on weekends and days off as a means of supplementing their regular income; others work in jobs subject to frequent layoffs or slack time, the construction trades for example, and fish during this slack period; and others have only a part-time shoreside job or a full-time shoreside job with very flexible hours that permit two or three days a week fishing (many firemen are also fishermen).

The ownership of the boats of the local fleet is also in a constant state of change. Some of these ownership changes are voluntary and unremarkable expressions of expansion or some other change in the business environment of the individual in question. Unfortunately, however, there are many ownership changes arising from bankruptcies, near-banruptcies, or severe liquidity crises. Many of the local fishermen are operating in the severe capital shy atmosphere that is so typical of small boat fishing throughout Massachusetts. Until that situation is changed by the proper combination of Federal, State, and local actions, the small boat fleets of the Commonwealth will remain unstable and in a continuing state of flux.

VII.4 The Harbor Communities

Though they share the Merrimac as a common harbor, there are many sharp distinctions and contrasts between the two communities of Newburyport and Salisbury. Though Newburyport is the smallest city (form of municipal government) in the Commonwealth with a population of 16,341, Salisbury is less than one-third that size with a population of 4,967. Newburyport is a city governed by a mayor (strong mayor form) and city council, and Salisbury is a town governed by a board of selectmen and the annual town meeting.

Physically, Newburyport is best characterized as a suburban community, with much of the population living in contiguous residential neighborhoods of predominantly single family dwellings. Two, three, and four family dwellings may be found in some of the older neighborhoods and there have been a number of multi-unit apartment complexes built in recent years by both private and public interests (veterans' housing and housing for the elderly). Newburyport has a well-defined and compact central business district, including the redevelopment area, and a second commercial district, including a shopping center, near Route 95. The busiest part of the Newburyport waterfront is adjacent to the central business district, though the active waterfront extends well into residential and light industrial areas both upriver and downriver of the central business district.

Much of Salisbury, in contrast to Newburyport, is more rural in character but with the notable exception of the resort area at Salisbury Beach. The center of town, with the town offices and a modest concentration of stores and service stations, is not a well-defined central business district but rather a more diffuse "thickly settled"

area at the intersection of Routes 1 and 1A. The Salisbury Beach area has a totally different character from the rest of the town in that it is a dense collection of hotels, motels, restaurants, fast food stands, bars and cocktail lounges, and extensive amusement areas with rides and games. Many of the dwellings in the area, whether single or multiple units, are not winterized and are used only during the warm beach months. The beach in question faces on the Atlantic Ocean while the harbor waterfront is on the Merrimac River. By land the two are several miles apart, and the harbor is also a distinctly separate area from the town center. With the exception of the small residential area called Ring's Island, the harbor area of Salisbury is physically and psychologically remote from the rest of the town. It is both physically and conceptually much closer to Newburyport than to either the town center or to Salisbury Beach.

Because of the relative isolation of the Salisbury harbor from the rest of the town and its proximity to the Newburyport downtown center, the development of the Salisbury harbor has been and probably will continue to be, heavily influenced by the activities across the river. Persons using the harbor, especially commercial fishermen, can and do obtain some services in Newburyport and others in Salisbury. Marina operators and others contemplating waterfront investments or expansions in either community of necessity must look at the combined market of the two communities and the combined competitive situation. The inclusion of Salisbury in this study is a tacit recognition that public bodies should adopt a similar stance in general planning activities and in the funding and implementation of additional public facilities for either recreational or commercial interests in the area.

Both communities were affected by the general exodus of factories from New England to the south in the fifties and sixties, and unemployment in the area remains high to the present. According to statistics obtained from the Division of Employment Security, the January 1977 unemployment rate in the area was 11.3% which, although still high, is still a substantial improvement over the recent past (August 1976 - 13.0%; January 1976 - 16.4%; August 1975 - 16.5%). Because of these consistently high unemployment rates, both local governments have had a continuing and strong interest in attracting new businesses and creating new jobs. The public in general seems to share this interest and it is the opinion of the consultant that this shared interest in new jobs would be one of many positive factors that could ease the implementation of future harbor development plans.

The most significant physical characteristic of the communities adjacent to the harbor is the urban renewal area of Newburyport. The area in question encompasses much of the central business district and part of the waterfront as well. The entire urban renewal effort in Newburyport has had dramatic impacts both on Newburyport and on the surrounding towns far beyond the mere physical changes. The urban renewal process has affected the economy of the area by providing jobs during both the implementation and the subsequent operation of new businesses in the renewed area.

One could even argue that the downtown improvements have contributed significantly to the development of other parts of the city by improving the attractiveness of the city to new residents and investors. Many buildings outside the downtown urban renewal area have been restored or refurbished either privately or, in some cases, with the assistance of public grants. This is true of both

residential and commercial properties. Real estate values have escalated dramatically in recent years, in part due to the increased demand from new residents attracted to the city by the general quality of life symbolized by the downtown area. As part of this influx of new residents there have been significant demographic changes in the population, accompanied by some tension here and there between long term residents and more recent arrivals. (The term "carpetbagger" is not heard as often as it was during the formative stages of the urban renewal project, and it is likely to be used more facetiously now than it was a few years ago.)

The point that is being made here is that the most significant fact of life to future harbor development, on the Newburyport side for sure and on the Salisbury side to a lesser extent, is the urban renewal process. Figure VII.4.1 shows the downtown renewal area and the adjacent waterfront. The renewal area buildings have been fully restored (or are being restored) to their original mid-nineteenth century appearance and the buildings themselves have been complemented by brick sidewalks, streetlights reminiscent of period gaslamps, the absence of any overhead wires for power or telephone, restrictions on store and traffic signs, and similar exterior measures. Part of the renewal area, Inn Street, is limited to pedestrian traffic and features several small parks, numerous benches for shoppers and tourists, and a small playground. The buildings in the renewal area tend to be occupied on the ground floor by shops of various types, with offices and/or apartments on the upper floors. In appearance and use pattern the central business district has been restored to its status of a century or more ago.

The view from the renewal area to the river at present is marred by the construction work at the waterfront

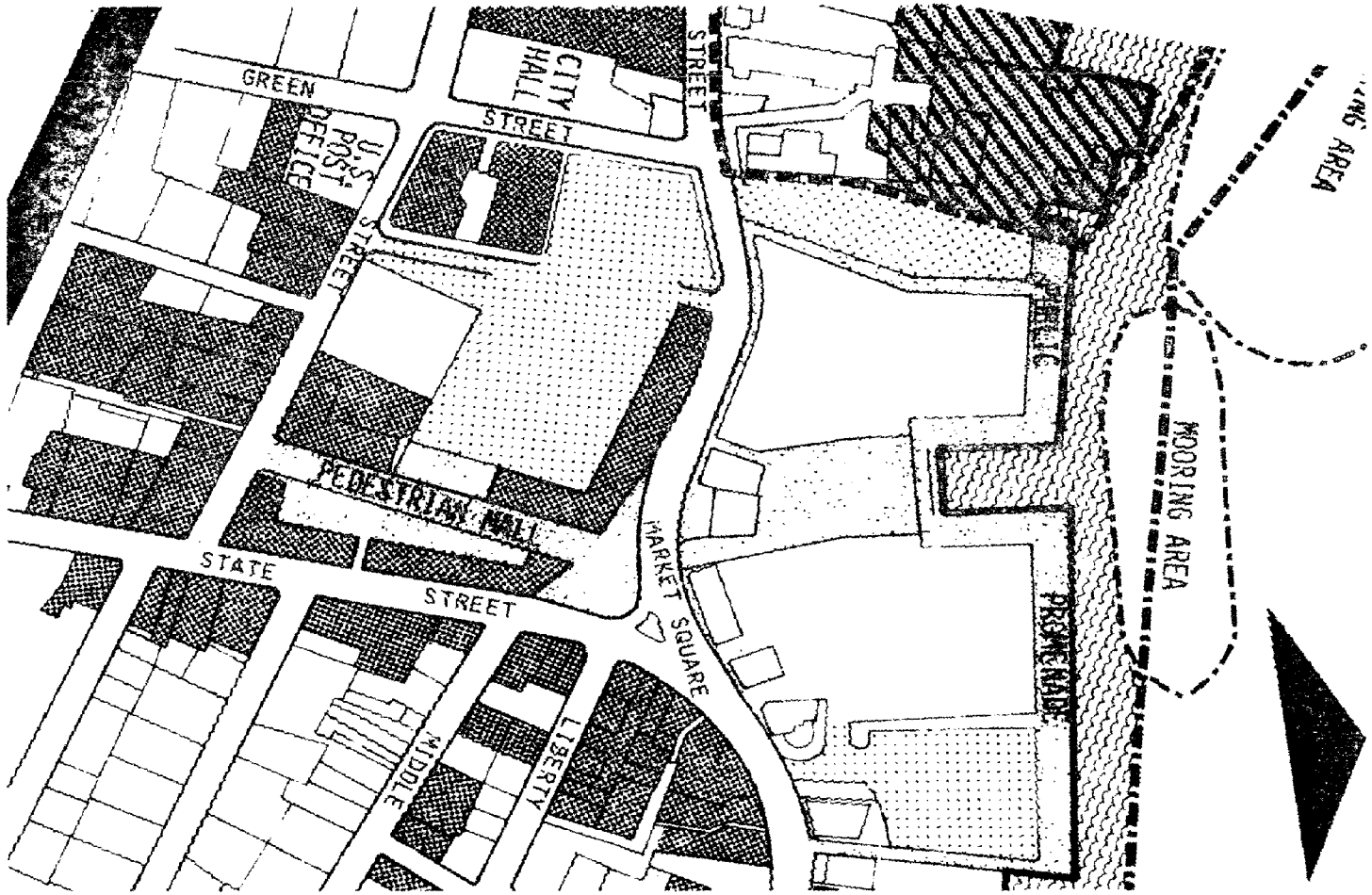


FIGURE VII.4.1 NEWBURYPORT WATERFRONT RENEWAL AREA
(This is an enlarged section of Figure II.1)

itself, but by summer 1978 the waterfront park construction will be complete and the waterfront itself will consist of 900 feet of bulkheaded and landscaped promenade. The parcels of land between the waterfront park and the renewal area are the last renewal parcels to be put out for redevelopment and the working plan of the Newburyport Redevelopment Authority is for these parcels to contain a hotel or motel and one or more premium restaurants along with several meeting and function rooms. (As mentioned earlier, there are at present no overnight accommodations in Newburyport.)

The waterfront immediately downriver of the waterfront park is presently unused, though the land just back from the waterfront itself is heavily used. The predominant occupant, the largest and most visible, is a lumber yard/hardware store which occupies a number of buildings as well as the intervening yard space. Other occupants of the near-waterfront land in this area include a restaurant/bar, a hobby shop, a shirtmaker, and several others including a few residences.

Immediately upriver of the waterfront park the waterfront is fully and heavily used for water related activities. Uses include a boat ramp, several marine hardware stores, marinas and yacht yards, two restaurants with a river view, a marine electronics store, and a dock for loading and unloading charter and party boats. This area is also, at present, the only place on the Newburyport side for commercial fishing boats to unload and, in winter, this area contains the only ice-protected slips on the river, though several more will soon be constructed on the Salisbury side with private funds.

Newburyport has been increasingly successful in attracting visitors to the city for shopping, dining and

tourist activities. The shopping and dining has developed into a year round activity and attracts people both from the adjacent communities and from the metropolitan Boston area. The tourist trade is obviously highly seasonal but attracts people from a much wider area. The city has received publicity in several national and regional publications, because of the architectural quality of the restoration work, the historical significance of the restored area, and the general tourist attractions of the area. Additionally, word of mouth appears to be an excellent advertising medium in a few selected instances. One of the more dramatic is the party boat business where word of mouth has developed pockets of business in such distant market areas as Ohio and New Jersey.

Both communities have numerous summer activities that attract tourists, and of course the Salisbury Beach resort and amusement area is a constant attraction. As far as distinct tourist activities are concerned, however, the Yankee Homecoming celebration in Newburyport has been exceptionally successful. Yankee Homecoming is best described as a week of small town activities that are enjoyable and attractive to locals and visitors alike. Among the many activities are road races, barbecues, parades, firemen's muster, jazz concert, historic house visits, sidewalk sales, the re-enactment of historic events, golf and tennis tournaments, church suppers, dances, band concerts, and many more. Aside from the locals and the tourists who participate, many former residents of the area plan family reunions at about this time (early August) and many local residents invite out of town or out of state friends to visit during Yankee Homecoming.

Though Yankee Homecoming week is the most intense period of tourist activity, it is not the only period and visitors come to Newburyport throughout the summer and in fact the year. In summer, however, the harbor and its facilities are a major attraction, in and of themselves and with the completion of the waterfront park will become more of an attraction even to those visitors whose primary interest is not boating or fishing. To achieve the full potential of the harbor in this fashion, however, steps must be taken to bring the harbor as psychologically close to the renewal area as it is now physically close and to treat the harbor and the downtown area as two parts of a unified whole in future development plans.

VII.5 Economic Impact of the Harbor

We have already touched on the recreational and aesthetic value of the harbor to the adjacent communities, and the direct employment estimates for the commercial fleet give at least a preliminary indication of the economic importance of the harbor. Ideally, a full and quantitative assessment of the economic impact of the harbor would be based on a detailed review of the income derived from the harbor by all direct and indirect beneficiaries. Unfortunately, such a detailed review is not possible because of the general unavailability of the necessary data and the usual reluctance of most small businesses to supply any information that would reveal the extent of their gross income or their profit and loss situation.

An assessment of the economic impact of the harbor can still be made, but it must be based on a combination of the limited direct data that have been gathered, some data and information in the public domain, and some reasonable assumptions and approximations. In the present case the direct data come from the limited number of recreational user questionnaires that were returned, the interviews with commercial users and marina operators, harbormaster records, and direct observations by the study team. The public domain data come mainly from the National Marine Fisheries Service publications of landings and prices of fish (the Blue Sheet).

Based on the interviews with commercial fishermen in the area, our best estimate of the weekly landings of groundfish for the harbor consists of the combined landings of all boats reporting plus a proportional allowance for those not reporting or not contacted. On this basis, the estimated local landings are 50,000

pounds per week for the months December to March; 75,000 pounds per week for April and November; and 100,000 pounds per week for the months May to October. There are no data to directly determine the split of these gross landings among the three major species of cod, haddock, and flounder, so we have used the annual average catch composition for Gloucester (which is available from NMFS) as a good approximation. Thus, we assume the gross landings of groundfish in Newburyport/Salisbury to be composed of 13% haddock, 62% cod, and 25% flounder.

The NMFS data on monthly price averages ex-vessel indicate that in recent years the December through March price has been 15.7% above the annual average, the April and November price 10% above the annual average, and the May through October price 14.1% below the annual average. The annual average price for Boston in 1976 was $0.309 per pound so, allowing for the usual $0.05 per pound differential between Boston and Newburyport/Salisbury, the 1976 annual average price for cod in the study area was $0.259 per pound ex-vessel. Applying the same differential to Boston prices, the apparent annual average price in the study area for yellowtail flounder was $.402 per pound and for haddock, $0.386 per pound. Then, applying the catch composition assumed from the Gloucester data, the annual price fluctuation assumed from the Boston cod data, these deduced annual average prices, and the Newburyport/Salisbury landings reported by the fishermen, the ex-vessel value of groundfish landed in the Merrimac can be shown to be approximately $1.25 million per year. A similar exercise for local boats that land their catch elsewhere shows that an additional $70,000 worth of fish is landed by the present fleet.

Local boats that fish commercially for lobster (there are many people who fish for lobster for their

own use) account for some $60-70,000 per year ex-vessel. The local swordfish fleet fishes for about 5 months at 10,000 pounds per week and an ex-vessel price of $1.402 per pound for a total value of $304,000 per year. These same boats also fish for and land some 2400 pounds per week of scallops for six months and, applying a positive $0.175 per pound differential to the New Bedford price, get an average price of $2.10 per pound for total ex-vessel value of $131,000 per year. The tuna catch value is more difficult to evaluate since the price can vary between 30¢ per pound and over $2.00 per pound in the course of the June - September season, and the price is not reported by NMFS. Likewise, boats from the Merrimac may land their catch at Newburyport, Gloucester or Provincetown and may sell either to private dealers or through the cooperative. Based on our interviews with people involved in the tuna market, however, we estimate the annual value of tuna landed by Merrimac boats at $325,000.

The Merrimac party boat fleet has about 250 spaces available collectively and the various boats sometimes go on full day trips, sometimes on two half-day trips, and occasionally on evening or overnight trips. Occupancy varies over the week and the season, but our best estimate of occupancy is full for two full day trips at $13 per head and half-full for ten half-day trips at $6 per head for gross weekly income of about $14,000. Some boats operate for nearly a seven month season, but on average a 24 week season seems more realistic, for an annual gross of about $335,000 for head fees alone.

The number of boats in the charter fleet is variable since many boats are on charter one day and fishing commercially the next. Our best estimate is that on any given day in the summer there are an average of four

boats on charter at $200 per day for gross weekly income of $5600 per week. Allowing a 20-week season, the gross annual income from charters is then about $110,000.

There is one local firm that exports live eels to Europe, but the vast majority of the nearly 2 million pounds handled in 1976 were imported from Canada. Nonetheless, some 50,000 pounds or more were trapped in the Merrimac itself at a reported per pound price of $0.40 for an annual value of $20,000 of local production. Finally, by applying the average prices for moorings and slips to the estimated number of spaces in the Merrimac, we estimate that the marinas and clubs in the area gross some $115,000 per year from these fees.

Adding all of the foregoing together, we get a total of some $1.65 million as the easily accountable economic impact of the harbor per year. This does not include any of the expenditures of local or visiting recreational boaters for ice, fuel, bait, ramp fees, fishing tackle, marine hardware, or the other direct costs of recreational boating. A very conservative estimate of the number of boats using the harbor is 1000 for a 20-week season. If each of these spends only $25 per week, again a very conservative estimate, then the first level contribution to the local economy is $500,000 per year. In addition to these operating costs, there are also the costs of purchasing and maintaining the boats and the money spent locally by non-local harbor users for food, accommodations, entertainment and general shopping.

One of the most significant contributors to the local economy is at present inactive, and that is the extensive clam flats on both sides of the river. When both communities complete their new sewage treatment plants, the clam flats will be able to be reopened and will very quickly be producing some 50,000 bushels per year of

soft shell clams with a wholesale value of about $1.25 million.

Thus, one can see that the lower bound contribution of the harbor to the local economy is in the vicinity of $3.5 to $4.0 million per year. When all non-direct expenditures are included, the total could well rise to $5 million. We do not wish to overemphasize the economic importance of the harbor nor to claim quantitative accuracy for these estimates because the data are scarce and our assumptions are open to discussion. Nonetheless, we do feel that the qualitative conclusion is clear that the harbor is a very important part of the local economy, and growth in the harbor can significantly affect the overall growth of the two communities.

CHAPTER VIII: CLAM AND MUSSEL HARVESTING

The Merrimac River tidal flats are one of the richest shellfish producing areas in the Commonwealth. Some would go even further and claim that the production capabilities of this harbor, in yield per acre per year, are without equal anywhere in the country. Unfortunately, the clam flats on both sides of the river are closed because of gross contamination of the flats themselves and the overlying water, and this potentially great local resource is presently unutilized.

Not surprisingly, there is considerable local concern about the problem, both in official and industry circles and among the general population. This concern is heightened by the ironic fact that the state's only shellfish purification plant, and one of the few in the world, is located within the City of Newburyport at Plum Island. This fact also causes considerable confusion about the reasons behind the closure of the local flats and the prospects for their ultimate reopening.

This particular aspect of the shellfish situation, closed flats in proximity to a treatment plant, is unique to the study area. The larger questions of why some flats are open and others are closed and how much and what kinds of pollution can be tolerated are, however, germane to many small harbors in the Commonwealth. It is hoped that this brief discussion will illuminate the situation somewhat as well as indicating the kinds of steps that can be taken to permit harbor communities to take full advantage of the resources available to them.

Like other fisheries in the area, clams and mussels have been harvested in the Merrimac since long before the arrival of the first European settlers. Shell heaps

indicate that the Indians used them for food and local history indicates that the settlers also used them as food, though not necessarily a food of choice in the seventeenth century. Shellfish harvesting did not become a really important local industry until the late eighteenth and early nineteenth century when shucked clams came into demand as bait for offshore groundfishing on longlines. This continued to be the main market for local clams until the mid-nineteenth century when clams became more popular for food, both locally and in the Boston market.

By the beginning of this century, there were some 125 men employed in the local industry and over 500 gallons per day of shucked clams were being produced, many of them for the Boston market, but some also going to the summer hotel trade in Portsmouth, York, and Hampton to the north. The price of clams in Boston at that time was about one dollar per gallon and a good shucker could approach a production rate of nearly one gallon per hour. Over a 10-hour day, he could dig and shuck up to five gallons and could earn $12 to $14 per seven-day week, quite a good wage for the time. (This and much of the other historical information in this chapter are taken from Reference (1) below.)

Though no firm data are available for this period on overall production rate of the local clam flats, indirect indications are that annual production may have been of the order of 100,000 bushels. Whatever the maximum production rate, however, it declined markedly during the first two

---

(1) William C. Jerome, Jr., et al: "A Study of the Marine Resources of the Merrimac River Estuary"; Commonwealth of Massachusetts, Department of Natural Resources Monograph Series; Number 1; June, 1965.

decades of this century and pollution became an increasing problem. In 1925 the local flats were closed to digging for human consumption and remained closed until 1928 when the City of Newburyport opened the Shellfish Purification Plant on Plum Island to treat clams from the local area. Meaningful records are not available for the early years of this plant, but in 1935 the plant treated some 23,000 bushels of clams. As more areas were closed to clamming even with treatment, however, this figure declined rapidly over the next decade until all flats were closed in 1945. Very limited local harvesting was possible for intermittent periods on the Newburyport side until the flats were fully closed about five years ago, but production has been insignificant since 1945 (e.g. eight bushels in 1951, 105 in 1958, 1514 in 1956), and amounted to only 10,567 bushels for the entire period 1950-1964. The Salisbury side has been closed entirely since 1949 and the Newburyport side since 1972.

Since 1961, the Shellfish Purification Plant has been operated by the State Division of Marine Fisheries and handles all Massachusetts clams that require depuration (purification).

Soft shell clams are the only commercially important shellfish harvested locally, though there are extensive mussel beds as well. The market for mussels has historically been limited to only a few ethnic groups, though attempts to develop wider markets are showing some success, at least in restaurants. At present, however, clams are the only species of commercial interest.

Both species are filter feeders in that they obtain food by filtering huge quantities of water through their gills and straining out the suspended nutrients. In so

doing, they also strain and concentrate any viruses or bacteria present in the water. If the water contains bacteria or viruses capable of causing disease in humans then the shellfish become unfit for human consumption. A large number of such organism types occur in human waste and can pass into the water overlying the clam flats if sewage containing sanitary wastes is discharged with no treatment or with only partial treatment. As we shall see, that is the major problem, though not an insoluble one, in the study area and probably in many other small harbors as well.

Because the clams are filter feeders, the process by which harmful organisms are concentrated in their bodies is, to a degree, reversible and this fact is the basis of the shellfish purification process, or depuration. Clams that have lived in a moderately contaminated environment can be induced to purify themselves if they are placed in a near sterile environment and their natural feeding behavior used to essentially "wash out" the harmful organisms in their bodies. The process is deceptively simple, but can only be used on clams from areas classified as "moderately contaminated." Clams from "grossly contaminated" areas such as the Merrimac are not suitable for depuration.

Clams from moderately contaminated areas are dug in the usual way and washed and boxed. They are then brought by the digger to the plant at Plum Island. At the plant they are placed in large, open depuration tanks containing recirculating clean and sterile seawater. In yet another paradox, this water is taken from the Merrimac River near its mouth, but it is drawn into the plant only on the rising tide so it is in fact clean seawater and not river water.

The water is sterilized and its sterility maintained by recirculating it through a closed chamber containing ultraviolet lamps. The intense ultraviolet light kills all entrained organisms in the water. The shellfish filter the sterile water and excrete the contaminating organisms they had collected in their natural environment and these organisms are then killed by the ultraviolet light as the water circulates through the sterilization chambers. If the clams are not too contaminated initially, then after several hours of this treatment, the bacteria count will drop to tolerable levels and the clams become suitable for human consumption.

Before discussing the numerical standards of the process, we should point out that all of the standards are at present based on the concentrations of coliform bacteria. As we have noted, there are many harmful organisms present in human waste and raw sewage, such as hepatitis, typhus, typhoid, and various forms of dysentery and cholera. For most of these, there are no tests for presence of the organisms that are both simple enough for routine use in conjunction with a daily shellfish monitoring program and yet reliable enough to protect public health. While direct evidence of the presence or absence of these organisms is not readily available, an excellent indirect measurement is possible by testing for the presence of fecal coliform bacteria. This test is relatively easy to perform and has been shown to be a reliable indication of pollution. Nonetheless, since it is indirect rather than direct, the Department of Public Health prohibits shellfish harvesting in certain areas, regardless of the fecal coliform test results, if gross pollution is evident and therefore gross shellfish contamination by infectious pathogens is highly probable.

Against this background, we can now review briefly the public health factors that restrict, control, or prohibit

the harvesting, treatment, and sale of shellfish (soft shell clams) in Massachusetts. The first test a clam flat must pass is a sanitary survey in which the overlying water and its tributaries are surveyed for gross pollution problems. Direct discharge of raw sewage into such waters will result in the area being closed as will discharge of inadequately treated sewage or the presence of a combined sanitary and storm sewer system that permits raw sewage to bypass the treatment plant. Again, the reason for closing an area such as Newburyport and Salisbury solely on the basis of the sanitary survey is that the only test currently available is for coliform bacteria and this is only a proxy or indirect indication of the presence of other serious pathogens such as viral hepatitis.

If an area passes the sanitary survey, the next steps are tests of the overlying waters and the shellfish meat itself. In these tests, the coliform bacteria "count" is based on the number of culture colonies that grow in a culture medium over a 24-hour period. A complete definition of bacteria count would require a full discussion of the test procedure, which is not really germane to the discussion at hand, so we will simply refer to the numerical values without further explanation as a quantitative indication of the relative position of clean, restricted, and grossly contaminated clam flats.

When the overlying waters of a clam area are tested and show a coliform count of 0-70, the area is classified as clean and unlimited harvesting of clams is allowed. "Unlimited" here refers to regulation for public health purposes at the state level. The local municipality may still elect to restrict harvesting purely from a shellfish management point of view. If the bacteria count for the overlying waters is in the range of 70-700, the area is

classified as moderately contaminated and only restricted harvesting is allowed with subsequent depuration at the Plum Island Plant required. If the count for the overlying waters exceeds 700, the area is classified as grossly contaminated and no clam harvesting is allowed.

The third criterion relevant to the clam flats themselves is the count for the meat of untreated clams. If the count for meat taken from a clean or restricted area exceeds 1600, the area is immediately closed and a sanitary survey conducted to determine the cause. Typically, the reason for a sudden jump in the meat count is a sewage system disfunction that introduces a point source discharge to the area. When the cause is found and repaired, or if no evident cause can be found, the area's water and shellfish are retested until they meet standards and the area can be reopened. It should be pointed out that a high count for clams ostensibly taken from a previously clean or only moderately contaminated area can be, and apparently has been, caused by a digger intentionally mislabelling clams illegally dug in a closed area.

Clams from restricted areas are treated at Plum Island by the process outlined earlier. The process is, as we shall see, quite effective but its effectiveness is highly dependent on the oxygen content of the depuration water. The oxygen content goes down as the water temperature goes up, so the process is least efficient in summer when demand for the plant's services is highest. A water cooling system would be a valuable addition to the plant's facilities.

Each lot of clams is tested for coliform bacteria, but it is important to note that the test itself takes 24 hours. Any lot of untreated clams with a "score" over

1600 requires that the Department of Public Health be notified and the harvesting area is then closed as noted above. With an untreated score over 1000, the lot must be tested again after 24 hours of treatment. If the untreated score is less than 1000, then the lot is treated for a total of 48 hours (the minimum) and then released to the digger with no further resting required.

For lots of clams with a raw (untreated) score of over 1000, an additional test is taken after 24 hours treatment. If this 24-hour score is below 500, then the clams may be released to the digger at the end of 48 hours total treatment with no further testing required. If the 24-hour score is over 500, then an additional test must be conducted after 48 hours of treatment. If this 48-hour score is below 230 (the market standard according to Federal regulations), then the clams can be released to the digger immediately. (Note that, because the test itself takes 24 hours, clams that require and pass a 48-hour test will, in fact, receive 72 hours of treatment before being released; clams that require a 72-hour test will actually receive 96 hours of treatment; and so on.) If the 48-hour score is over 230, then a 72-hour test is required; if still over 230, then a 96-hour test is required; and if the clams don't pass the 96-hour test, they are seized and destroyed. In fact, clams treated for more than 96 hours are not really marketable because of taste and appearance, anyway, so a lot that doesn't pass its 72-hour test is lost to the digger for all practical purposes, and further treatment and testing is usually not worth the bother.

In addition to these standards for each lot, the plant itself must meet performance standards. It must conduct four 24-hour tests and four 48-hour tests each week, whether

required by the count on individual lots, or not. The reason for this requirement is simply to monitor the performance of the process and the plant itself. Though any given lot must only meet the market standard of 230 to be released to the digger, the plant itself must, over the long run, meet a standard of 130 or less in 90% of all lots treated and released. Also over the long run, the median of all lots treated must be less than 50. As an indication of just how efficient the process really is, the actual performance of the plant for 1974 and 1975 shows that 99% of all lots treated were released with a score less than 130 and the median of all lots treated was 17. This is all the more remarkable when one realizes that the test cannot discriminate scores below 17, so the actual median is somewhere between zero and 17 for the period in question.

Returning to the study area, all of the flats in the Merrimac Harbor, some 600 or more acres of highly productive clam flats, are classed as grossly contaminated and all harvesting is prohibited. The main reason for this is the sanitary survey, but the flats fail the numerical tests as well. On the Salisbury side there is at present no sewage treatment at all. Though many parts of the town have septic tanks rather than a sewage system, the Salisbury Beach area is tied into a combined storm and sanitary sewage main that discharges directly into Black Rock Creek which, in turn, feeds into the Merrimac Harbor. Though there is a pumping station near the discharge point, there is no holding capacity and the sewage cannot even be held back for an outgoing tide when its effect on the harbor could be minimized.

In summer, the Salisbury problems are further exacerbated by the State operated reservation that has an extensive campground for trailers and campers plus a large bath house. All sewage produced here is sent directly into the Town main without treatment and is probably the major contributor to pollution in the harbor in summer.

Newburyport has a sewage treatment plant, but it is only a primary plant and is only partially operable. It is better than straight raw discharge but only marginally so. Most of Newburyport is tied into a municipal sewer system, parts of which are over a century old, but in several areas of the City storm and sanitary sewers are interconnected. During very light rain, the increased flow is just barely manageable by the treatment plant; but during any heavy runoff part or all of the plant must be bypassed, allowing the combined storm water and sanitary wastes to go into the river untreated.

Aside from these obvious and visible shortcomings on both sides of the river, the coliform tests alone would require the flats to be closed. Scores of coliform tests for overlying waters on the Newburyport side have been as high as 3000 over the past year - over four times the allowable maximum for moderately contaminated areas. Tests on clam meat have resulted in scores as high as 30,000 on the Newburyport side and 130,000 near Black Rock Creek on the Salisbury side. Though these dramatically high bacteria counts are individual tests and not averages, they nonetheless serve to underscore the fact that the Merrimac clam flats are indeed grossly contaminated.

The situation is far from hopeless, however. Both communities have received Federal funds through state

channels for sewage treatment plants - a new one in Salisbury and extensive improvements to the existing plant and collection system in Newburyport. Both of these projects should be complete by late 1979 to mid-1980, by which time all of the upriver plants will also be on line. Once these plants are put in operation, experience in other localities indicates that the clam flats can be opened to restricted harvesting within a matter of weeks or a few months at worst.

The potential economic impact of these clam flats is substantial to say the least. Earlier in this report we have used a very conservative estimate of $1-1.25 million per year as the wholesale value of clams that could be harvested locally, but the potential is actually much greater than that. The figure of $1 million is based simply on a harvest of 50,000 bushels at a wholesale price of $20 per bushel and was intentionally chosen as a lower bound in the interests of conservatism.

Less conservatively, however, we can consider that the local flats have probably produced as much as 100,000 bushels per year at the turn of the century. We can't know for sure if this figure is correct or if all of the producing flats at that time are still available. Nonetheless, the Merrimac River Estuary Study in 1964 estimated, based on field samples, that the 218 acres of Salisbury flats had 27,000 bushels of harvestable clams; the 530 acres of Newburyport had 43,000 bushels of harvestable clams; and the 5 acres of the Town of Newbury had some 4,000 bushels of harvestable clams. These samples were taken at a time of very limited digging in a few restricted areas of the harbor and it was found that the samples taken from flats that were being dug were actually

greater, i.e. more harvestable clams per unit area, than from flats that were closed due to pollution. This has apparently been observed in other clam areas as well and indicates that clam flats that are being worked by digging are more productive than flats that are unused. It is also possible to open more area to clam growth by removing eel grass, so, while an annual production potential of 100,000 bushels is clearly highly optimistic, it nonetheless remains within the realm of possibility.

In terms of local income, the actual price for soft shell clams in the shell has been about $30 per bushel in mid-1977. Shucked clams are about $28-30 per gallon. There is no definitive conversion factor of bushels of clams to gallons of shucked clams since the yield will vary not only with the average size of clams but also with the area where they are harvested, but a reasonable range is one-and-one-quarter to one-and-one-half gallons of shucked clams per bushel of clams in the shell. As a very optimistic guess of the income potential of the local clam flats, 100,000 bushels per year harvested, with half of that sold shucked could produce a total local income well in excess of $3 million per year. When one compares this optimistic estimate with the current value of finfish taken locally, less than half that, it is clear that the investments in improved sewage treatment plants will have impacts far beyond mere aesthetics.

CHAPTER IX: ASSESSMENT OF LOCAL GOALS AND OBJECTIVES

IX.1 Interviews

While the foregoing chapters have discussed the characteristics and needs of small harbors in general, the model harbor of Newburyport/Salisbury as well as any other small harbors which may undertake development activities must each be considered in view of its own particular characteristics and needs. Physical and economic factors are clearly important in such development planning, but perhaps equally important is the community outlook with respect to the harbor and other local goals and objectives. Recognizing that any development plan, regardless of how sound it might be in any engineering or economic sense, would be of no value and have little prospect of ultimate implementation if it were not totally consistent with local goals and objectives, the earliest activities of the study team were directed toward ascertaining the community temper with regard to the harbor, its current use, and its future development. The mechanism for measuring this temper was an extensive series of interviews with various members of the community whose interests were impacted by the harbor.

Though the interviews were extensive, they were purposely kept informal for a number of reasons. First was the belief by the consultant that formalized interviews or questionnaires, while undeniably useful for certain statistical purposes, are somewhat dry and tend not to reveal the so-called soft data, the thoughts and ideas behind the words, that are necessary to an evaluation such as this. There was also a concern that the reticence and closeness of community that is usually attributed, rightly or wrongly, to New England fishermen in the face of "one more study" might become especially

pronounced in the extremely small fishing community in the study area. The size of the two communities raised similar concerns and, coincidentally, the small size of the communities and the fishing population also made it possible to use the informal interview vehicle rather than a formal questionnaire. (Later in the study, questionnaires were used in an attempt to elicit more quantitative information from both recreational and commercial harbor users in order to better define the current status of the harbor. While that effort was quite successful in the case of the commercial fishermen, possibly because it was preceded by these mutually informative informal interviews, it was quite unsuccessful in the case of the more general boating public. These questionnaires and their results will be presented in the next section).

We began by interviewing fishermen and tried to ask as few questions as possible but rather to listen carefully as their views and opinions were expressed and to take copious notes. This approach was admittedly time consuming and frequently required going back to some of the interviewees for clarification or further information, but in the end the study team was able to get rather a good feel for what the major concerns were and how they could be approached. Not surprisingly, the opinions and "data" collected from different individuals and different interest groups were frequently contradictory but the method of collection permitted the study team to have a fairly good basis on which to form reasonable judgements, admittedly still subjective, as to which of a pair of contradictory views was either more correct in an absolute sense or more representative of community views.

From the interviews with fishermen, a pattern quickly emerged to show that their major concerns were in four areas - a dock to unload their catch, a supply of crushed ice to preserve the catch, a means of protection from floe and sheet ice in the winter, and improvements to the navigational channel at the mouth of the river. There were also concerns expressed about the marketing mechanisms available to them and the related issue of a lack of suitable cold storage in the area but, in view of the rather large impact these two issues can have on income, the fishermen seemed in general to have less concern for these two issues than the four mentioned above. One suspects that the relative importance of the various issues may well have been heavily influenced by the time of year when the interviews were conducted, during an especially severe winter characterized by heavy ice on the river and high prices for the catch.

The lack of an unloading dock was mentioned by nearly all fishermen as a major personal problem for them and a major obstacle to further growth of the local fishing industry. There is, of course, no publicly owned fishing pier in either community nor is there any privately owned dock devoted exclusively to handling fish. One of the larger marinas does make a substantial effort to service the fishermen in this way and, in winter, the handling of fish is a major part of its business. It is, however, primarily a recreational marina and during the warm months the overwhelming majority of its business is involved with party boats, charter fishing boats, and servicing recreational boating. During these months, the fishermen are, at least according to them, given low priority on dock space and services even to the point of having to interrupt unloading operations to make room for a party or charter boat. There are three other marinas that also

do some fish handling but, again according to the fishermen, on essentially the same basis. The marinas on the Newburyport side have deep water and at least the distance from the pierface to the truck, scales, and cranes is manageable. The Salisbury side, however, has the further problem that the marinas are adjacent to relatively shallow water and consequently the fish that is handled has to be moved manually from the boat over a relatively long pier to the trucks in the marina parking lot. Partly because of this lack of a proper and dedicated unloading dock, at least some boats owned and operated by area residents regularly steam to other ports, most notably Gloucester, to unload and sell their catch. Though one cannot say that this is due only to the lack of unloading facilities in Newburyport and Salisbury, it is clearly a major factor.

The lack of a local supply of ice for preserving and shipping the catch was also frequently mentioned as a major drawback. At present, a local fishermen is faced with several unpalatable choices with regard to the ice problem. He can use no ice or less than he really should. This is frequently the choice made in winter but if the fish are not properly iced in the warmer months, the fisherman can either lose part of his catch outright to spoilage or receive a substantial reduction in ex-vessel price because of partial deterioration. The second choice is to buy ice from the limited local supplies. The problem is that the only local distributor is engaged primarily in selling block ice and ice cubes cut from block for home use, bars, restaurants, and the like. He can meet some of the needs of the fishermen by shaving block ice but he must charge a price that reflects both his high cost structure and his high priced alternate markets. The result is a price per ton that is about double the going

rate for fish ice in the ports that have it. Those ports present the third alternative to the local fishermen and the only really viable one at present. Both Boston and Gloucester have large supplies of ice for fishermen at reasonable cost as does Portland to the north. Because of distance, Portland is out of the question so the local fishermen usually steam to Gloucester to ice down or ship the ice in by truck from Gloucester or Boston. Both sources involve considerable cost and inconvenience, reducing the profitability of the fishing business and reducing its attractiveness as a means of livelihood.

The third major concern of the fishermen is the floe ice and sheet ice on the river during the winter months and the early spring. This is the major reason that many locally based boats are either taken out of the water during the prime winter season or are moved to other ice-free harbors. Ice floes of several tons are not uncommon on the Merrimac and they have been extremely damaging to both boats and fixed structures on the waterfront. The ice can come downriver on the outgoing tide but the problem can be just as severe, and sometimes worse, coming upriver on the incoming tide. This upriver ice movement can arise either by upriver floes getting trapped in the eddies near the harbor mouth and then moving upriver again on tide reversal or by sheet ice from the extensive tidal marshes. One of the most severe icing conditions in recent years occurred in early winter when there was a heavy, wet snowfall during the tidal ebb, accompanied by rapidly falling temperatures. The wet snow froze on the exposed marshes and then was lifted and carried up-river by the rising tide with rather disastrous results for several marina structures and boats, especially the former. During periods of very heavy ice flow, the boats

are usually protected by either mooring to one of the nearby bridge abutments, the more common tactic, or by staying under power and maneuvering to avoid the largest and most dangerous floes. Either tactic means unproductive time on board and requires a bit of foresight as well. Even so, several boats were severely damaged in the Merrimac during the course of this study and at least two were sunk by ice damage, though they were subsequently refloated. It should be noted parenthetically that surprisingly few of the wooden boats attempting to operate in the Merrimac year round are equipped with wood sheathing to protect them from ice damage to the hull itself. One assumes that this is just one more manifestation of the fact that small boat commercial fishing is an intrinsically capital-shy business.

The navigational channel at the mouth of the Merrimac is almost legendary among nearly all local residents, both fishermen and non-fishermen, boaters and non-boaters. Scarcely any local boat operator doesn't have at least one hair-raising tale to tell about nearly broaching or pitchpoling while trying to enter the river. (In January of 1977 one of the small U. S. Coast Guard cutters stationed at the Merrimac River Station went out to attempt to lend assistance to the tanker Chester Poling as it was breaking up and sinking in a storm and was unable to re-enter the Merrimac at the completion of its mission. It was nearly lost itself and eventually had to seek refuge in Portsmouth.) The mouth of the Merrimac is formed by two nearly parallel jetties extending nearly due east. The channel between the jetties is narrow and subject to both shifting and shoaling. During a northeasterly blow with high seas, the sea can and does break over the north jetty; but the worst situation occurs with an easterly wind and an outgoing tide near its ebb.

Under such circumstances there can be breaking waves over the shoal, the inner bar, in the main navigational channel. In such circumstances even the largest and most seaworthy boats with the most experienced skippers are well-advised to wait outside the river for the turn of the tide if at all possible. Even in less severe conditions, most experienced Merrimac River boaters usually avoid the outer part of the main channel and instead follow a course close by the north jetty which presents obvious hazards of its own. In all seasons, the north jetty is nearly submerged at very high tide and the lack of a light or even a radar reflector at the jetty end can make it difficult to find in any conditions of reduced visibility. The U. S. Army Corps of Engineers regularly performs maintenance dredging of the mouth of the Merrimac but it remains a very dangerous channel nonetheless. Most boating publications make note of this and it undoubtedly reduces the summertime cruise traffic that could be a meaningful addition to the area's substantial summertime tourist trade. The Corps of Engineers is currently investigating means of providing a long term solution to this problem by means of its Merrimac River Basin Model at the Corps testing station in Vicksburg, Mississippi, but any solutions that are found will be very costly and will require several years to work through the usual funding process, if indeed they are deemed to be economically feasible at all.

Though the fishermen did express a good deal of concern about the marketing of their catch, there seemed to be neither the depth of feeling nor the near-unanimity of concern that was evident in the issues already discussed. One assumes that this was mainly because ex-vessel prices were quite high during the period of the study and yet changes in the marketing method present the greatest

opportunity for directly affecting the real income of the fishermen. One cannot say that there is at present any marketing system for fish landed in either Newburyport or Salisbury. Rather there is an almost random collection of two-way deals, ad hoc arrangements, and unstructured common practices. This arises in part because of the nature of the people fishing. There are really very few full-time year round fishermen on either side of the river. There are quite a few more who are full-time fishermen for a significant part of the year or who fish regularly year round but hold another land-based job as well. At the other extreme of those landing and selling fish, there are essentially recreational boaters who happen to have an exceptionally good day fishing and end up selling what they can't eat, freeze, or give to the neighbors. There is also a full spectrum of "vertical integration" ranging from those who sell their fish at dockside to the marina operator or fish dealer, to at least one fisherman who trucks his own fish to Boston or Gloucester for direct sale to wholesalers.

There is no standard, but one of the more common methods involves paying the dock owner a poundage fee for landing the fish (usually $.03 per lb.), then paying a trucking firm to move the fish to market (usually $.01-$.03 per lb. including shipping ice), then paying a commission to a broker to sell the fish at a price usually pegged to the day's auction price at Boston Fish Pier (usually $.02 below auction and an 8% commission). Aside from the several middlemen involved in all this, the auction price of fish can be very volatile and swings of a factor or two from one day to the next are not unheard of. The fishermen are concerned that there must be a better way, that they are paying too many middlemen, and that they would like to be insulated from or be able to take advantage of the wide price swings in

the market, but there seemed to be a certain amount of vagueness as to exactly what should be done to improve things.

Contrast this with the other issues where they seemed to have very specific ideas as to where a dock should be, what facilities it should have, how much ice was needed, what should be done about floe ice, etc. The only idea in this area that seemed to have some general degree of acceptance was that a local cold storage capability would permit them to withold their catch from the market on days when prices were especially bad and to sell it a day or two later when things would hopefully improve. Other than this, there seemed to be a rather general desire for a better deal on selling the catch coupled with a resentment towards the various middlemen, but without any concrete plans or ideas on how to improve things. This lack of specificity about the marketing structure may spring in part from a less than comfortable attitude towards business matters. One fisherman even went so far as to say in essence, " I know how to fish, but I don't know anything about business so I'll let someone else handle that for me".

Other than the fishermen, the group with perhaps the strongest commercial interest in the harbor are the marina operators. In many ways, they as a group are the exact opposite of the fishermen. They are, in general, both full-time employees of their businesses and the sole or major investors in their businesses. Moreover, they are in a business with a relatively long term and stable growth pattern that has given the industry quite a good profit picture, though this is not to say that any one marina is necessarily a moneymaker. Because the majority of their assets are usually represented by the marina real property and associated equipment, they are very bankable and thus are not faced with the chronic capital shortness that

characterizes the fishermen. They are viewed by the banks and the community in general as stable, responsible businessmen in contrast to the corresponding view of fishermen as poor businessmen, unstable in both their business and personal lives. It should be pointed out here that no conclusion is being drawn except with regard to the perception of these two groups by the banking community. Whether that perception is a correct one is immaterial, but the effect it has on the two groups as far as their ability to contribute to harbor development is quite germane.

The marina operators in general expressed great concern that any State, City, or Federally financed harbor improvements should not infringe on their business. They would not, for example, like to see any publicly financed or owned waterfront facilities that could either draw substantial business from them or competitively reduce the market price of the services they offer. On the other hand, they would support any harbor development plans that would generally increase the use of the harbor by both commercial interests and recreational boaters since this would increase the market available to them. As an example, nearly all marina operators expressed the view in common with the fishermen, that a long term improvement in the mouth of the river is highly desirable. The reasoning here is that the current situation with the channel and bar dissuades most of the potential cruising traffic from stopping in Newburyport or Salisbury for fueling or provisioning, overnighting, or longer visits. Similarly, boat owners from surrounding communities are less likely to berth their boats here because of the limitations in schedule imposed by being able to cross the bar comfortably only during certain times in the tidal cycle.

The operators would also like to see more effort on behalf of the City or some organization like the Chamber of Commerce to publicize the many tourist attractions in the area in boating publications. They correctly point out that many standard cruising publications make no reference to the revitalized business district in Newburyport and the attraction that holds to the cruise trade. The attraction of the area to such tourists will increase even more with the completion of the waterfront park with its guest moorings and slips conveniently located just adjacent to the entire urban renewal area.

Those slips, by the way, are a major cause of concern to the marina operators. At present the City has no firm plans for those slips, or the mooring area in front of them, with regard to use rules, fee structures if any, operational responsibility, maintenance, or policing and regulation. The marina operators fear that the slips may become de facto free slips for local residents who choose to exercise "squatters rights" or that the City will set up a no-cost (to the user) business in competition with their attempts to obtain cruise trade business. The currently operating public boat ramp at Cashman Park is frequently cited as an example of such public competition with private business. The ramp fee at the public ramp is $1.50, while most private ramps charge from $2 to $3 per launch. It should be pointed out, however, that the services offered are not identical. At the public ramp, the user obtains the right to launch his boat himself and a place to park his car and trailer and that's all. At the private ramps, the owner gets assistance in launching and retrieving his boat and can purchase supplies such as bait, ice, fuel, food and drink, etc. Obviously, a segment of the public is willing to pay $.50 to $1.50 more for such added amenities, but the existence

of a simple ramp service at $1.50 may effectively limit the price that the market will bear for full service ramps to something like the public ramp price plus a service increment. In effect, when the City Council sets the public ramp fee directly, they are also indirectly setting the private ramp fees at the same time.

Notwithstanding the concern that the boat slips at the new seawall and waterfront park may compete with the existing marinas, the operators also have at least some ideas as to how the new slips could help their business. One idea is to have the City lease the slips to one of the private marinas to be operated as an extension of his current business, though it is not clear whether the funding agency regulations would permit this. Another proposal that has been advanced is to permit charter and party boats, some operated by marinas and some by freelance skippers, to tie up at the new slips for advertising and display purposes, though not for loading and unloading of passengers. Again, the permissibility of this under the funding contracts for the new seawall and park is still unclear pending a formal ruling.

The position of the marina operators is perhaps best summarized as a desire to see the general usage of the harbor increased and made more attractive, especially to non-local boaters; an apprehension about new publicly funded facilities that might compete with private marinas; and an inclination to be associated with such facilities should they be built nonetheless. With regard to the second of these points, the consultants feel that those marinas that do service fishermen on a limited basis would prefer not to lose that business to a facility devoted exclusively to fishing, yet the amount of fishing business involved at present is not essential to the continued success of their operations.

Relatively few interviews were conducted with the public at large, but in the few that were conducted there was a surprising lack of awareness of the existence of a fishing business in the area, or a substantial underestimation of its size, and only a very general awareness of the current and potential contribution to local income from boating activities by non-locals and the very substantial numbers of non-locals who came here for charter or party boat fishing. There seemed to be a feeling that it would be good for the towns to encourage fresh fish sales and perhaps to have a premium seafood restaurant and fish market. Likewise, there is a general feeling that anything that attracts summer tourists is good for the local economy, and increased boat traffic was accepted as being in that category. There is also a good deal of public awareness of and pride in the revitalization of the downtown area of Newburyport and a feeling that the waterfront has been "left behind" and is out of step now with the contiguous areas. People seem to be anxiously awaiting the completion of the waterfront park and hope that other parts of the waterfront will be improved as well. Public access to all parts of the waterfront appears to be a major concern.

The two areas where there did seem to be a more specific awareness were the mouth of the river problem and the fact that the clam flats on both sides of the river were closed due to contamination. The mouth of the river is legendary even among non-boaters and people feel that "something should be done". There is a certain amount of confusion, though, among the Army's routine channel dredging operations, the frequently discussed but never implemented large capital dredging and jetty reconstruction projects, and the many proposals and discussions in the local paper about plans to control beach erosion on Plum Island. This latter issue has nothing to do, of

course, with the harbor itself. On the shellfish issue, local opinion is well aware that the local clam flats have enormous potential for harvesting, but there is a good deal of public confusion as to exactly what is wrong and how it can be corrected. Many people wonder, for example, why clams can be brought from all over the Massachusetts coast for depuration at the Plum Island clam plant and yet the local clams can't be treated. There is also a concern that the problem with the local flats lies not with local sewage treatment, or the lack of it, but with the sanitary and industrial wastes dumped in the river upstream. Because of this confusion among members of the public and some officials in the study area and the probability that persons associated with other harbors may have similar misconceptions, the shellfish situation is discussed in some detail in Volume II of this report.

Among those members of the public that own or otherwise have access to boats, there seemed to be fairly general satisfaction with things as they are with the notable exceptions of the conditions at the mouth of the river and the marking and maintenance of the river channel itself. These points are especially important to the many sailboats on the Merrimac since they may draw more water than the largest commercial boats and have difficulty navigating at or near low tide. There are several areas of the river, ostensibly within the channel, where sufficient shoaling has occurred to present a hazard to navigation to these boaters at slack tides.

Overall, it is the opinion of the consultant that in both communities of the study area there is significant desire for harbor developments and improvements and that there would be very broadly based support for the most frequently mentioned development possibilities. Though

there are some competing points of view on some issues, fishermen versus marina operators for example, there also seems to be a rather general sense of cooperative spirit that should permit most reasonable development plans to proceed relatively free of major controversy.

IX.2 Surveys

IX.2.1 Survey of Recreational Users

Early in the study it was realized that it would be useful for development planning purposes and for later attempts to obtain funds for implementation to have a quantitative indication of the level of harbor use as well as related statistical data. Among other perceived potential uses for such data would have been to strengthen the case for major harbor improvements with the U.S. Army Corps of Engineers. It was hoped that a quantitative statement of the very high level of use of the harbor by both the commercial users and recreational users could facilitate funding of needed improvements, especially capital improvements near the mouth, but also an improved program of maintenance dredging of both the mouth of the river and the harbor channel. In an attempt to obtain the desired data, a boatowners questionnaire was prepared (Figure IX.2.1.1) and, with the cooperation of the management of the Newburyport Daily News, was published in the local newspaper three times over a period of two weeks. The questionnaire was accompanied by a news story explaining the purpose of the questionnaire and some of the background of this study. Boatowners were invited to submit completed questionnaires to either of three addresses or to deliver them in person. The news story also promised

Figure IX.2.1.1

RECREATIONAL HARBOR USERS QUESTIONNAIRE

1) Boat Name _____ Number _____
2) Owner _____
3) Street Address _____
4) City or Town _____
5) Primary use of boat
   ___ Pleasure cruising or sailing
   ___ Non-commercial fishing
   ___ Limited commercial fishing (__finfish __shellfish __both)
   ___ Full commercial fishing (__finfish __shellfish __both)
   ___ Charter ___ Party
   ___ Other _____
6) Propulsion
   ___ Power (HP=)
      ___ Outboard
      ___ Inboard/outboard
      ___ Gas single screw
      ___ Gas twin screw
      ___ Diesel single screw
      ___ Diesel twin screw
      ___ Other _____
   ___ Sail w/ auxiliary
      ___ Outboard
      ___ Gas single screw
      ___ Gas twin screw
      ___ Diesel single screw
      ___ Diesel twin screw
   ___ Sail only
7) Hull Material
   ___ Wood
   ___ Fiberglass
   ___ Aluminum
   ___ Steel
   ___ Other _____
8) Dimensions
   Length overall ___Ft. ___In.
   Maximum beam ___Ft. ___In.
   Maximum abovewater height ___Ft. ___In.
   Draft ___Ft. ___In.
   Draft** ___Ft. ___In.
   **For sailboats w/movable keel or daggerboard, please show both drafts
9) Summer storage
   ___Mooring
      ___Salisbury
      ___Newburyport
      ___Plum Island Basin
      ___Amesbury
   ___Trailer
   ___Slip
      ___Salisbury
      ___Newburyport
      ___Amesbury
10) Winter storage
   ___Wet(Where please_____)
   ___Marina
   ___Home or other dry storage
11) If you trail your boat;
   On average, how many times per summer do you put it in the water?____
   What is the usual fee?_____
   What is the average waiting time putting the boat in?_____
   What is the average waiting time taking the boat out?_____
12) If you moor your boat;
   Do you own___ or rent___ the mooring?
   Do you have your own dinghy___ or is tender service provided____?
   What is the annual fee for the mooring?_____
   How long have you had the same mooring?_____
   How many days per year do you use the boat?_____
13) If you use a slip;
   What is the annual fee?_____
   How long have you had the same slip?____
   Does it have 110 electric service?_____ Fresh water service?_____
   How many days per year do you use the boat?____
14) Over the past year, how much do you estimate you have spent in Newburyport or Salisbury on fuel_____, bait_____, ice_____, hull parts and materials_____, hull labor_____, engine parts and materials_____, engine labor_____?
15) During the past year, how many times have you gone through the jetties?_____
16) Please indicate on the back the addition or modification to the harbor you would most like to see.
17) Also on the back, we would appreciate any other comments or suggestions you may have.

Thank you for your help.

complete confidentiality and made it clear that respondents could simply leave blank any information that they did not wish to supply for any reason at all.

As a source of statistical data the questionnaire was, to put it bluntly, a complete failure. The newspaper has a circulation of about 8000 in the study area and surrounding communities. We had made an educated guess that there were perhaps 1500 boaters in the area and had hoped that a statistically significant percentage of their owners would respond. In fact, less than 35 boatowners returned completed questionnaires. Several possibilities present themselves to explain this poor response and a brief consideration of them may prove useful to other communities considering such a poll as part of a harbor development planning process.

a) Taxes

Under Massachusetts law, excise taxes are levied on boats based on their value, and the taxes are due to the community in which the boat is located as of January 1. In fact, there are various extralegal ways to avoid excise taxes and apparently many boatowners saw the questionnaire as a possible source of information to the local tax collector, our disclaimers of confidentiality notwithstanding. We had asked for names and addresses on the questionnaire simply to avoid double counting when cross checking with mooring records, but clearly future pollsters would be well

advised to either not ask for name, addresses, boat names, or boat numbers or at least to make it very clear that such information was completely optional.

b) Mooring

At present, the City and Town charge no fees for placing a mooring in the harbor. (The only mooring fees are those paid by a boatowner to a marina for rent of a mooring and the attendant dinghy service. The local governments collect no mooring permit fees). Nonetheless, we have been told that at least some members of the boating public saw this questionnaire as just a tricky prelude to the levying of public mooring permit fees. Again, the dropping of all requests for identifying data should do much to alleviate such fears.

c) Time of Year

The questionnaire was published in mid-winter when few boaters are thinking very heavily about their boats and when many non-local harbor users are outside the circulation area of the local paper. Spring or summer would be a better time for a survey like this and the newspaper survey should be supported by questionnaires placed at each marina or other gathering places for boaters.

d) Convenience

Each respondent had to address an envelope and buy a stamp or hand deliver his response, This, after having taken the time to prepare the questionnaire in the first place, may have been just too much inconvenience. If funds are available, a better approach would be a business reply envelope with the questionnaire and/or convenient collection points such as marinas and clubs.

While the questionnaire failed in a quantitative sense, the few responses did provide the study team with some useful qualitative insights as to the major concerns and problems of the recreational boaters as contrasted with the commercial fishermen. These insights have been incorporated in the study results.

IX.2.2 Survey of Commercial Users

In contrast with the poor response from the boating community at large, the study team was able to obtain rather good quantitative information from the commercial fishing community. As we have noted earlier our first contact with this group was through informal interviews and these undoubtedly laid the groundwork for the more detailed questions that came later. The interviews began with a few individuals whose names were provided by the study team members from the two communities.

These individuals represented a cross section of the main user groups concerned with the commercial fishing - the fishermen themselves, the marina operators, and the charter and party boat operators. Among other things, each person interviewed was asked for a list of others he felt should be contacted and in this way it was possible to expand the original list to include nearly all persons in the area with an interest in commercial activities. For a variety of reasons, it was not possible to actually interview each person but at least one attempt was made to contact each.

The initial informal meetings usually took from a half hour to one and a half hours and were very loosely structured. Although they were predominantly meetings with individuals at their places of business, boats, or homes, at least one meeting with a group of five fishermen was held. In general, this approach was most useful and

informative not only as an information gathering technique for the consultant, but also as a means of assuring the interviewed users (and presumably others via scuttlebutt) that their experience and knowledge had value and that the harbor study would not be conducted by unknown persons unfamiliar with local problems. For all future harbor work of this type, it is recommended that this approach be followed, and that the interviewers have a working familiarity with the language, peculiarities, and customs of marine activities.

After these meetings were completed, a very brief telephone interview with other individuals was help for essentially the same purposes as the individual meetings and to inform them that a follow-up survey in greater detail would be made at a later date. This telephone interview proved useful in formulating some of the questions for the detailed survey and in breaking the ice for future discussions. One problem that arose during this initial phase of the survey was to prove troublesome throughout and that was the difficulty of locating individuals at home or at their boats. For phone contacts at home, evenings and weekends proved to be the best time and the mornings proved to be the best time to catch people at their boats but they were usually tired after a night of winter fishing and not really in the best shape for a leisurely conversation, though the cooperation from the fishermen was generally excellent. (It has been suggested that the best time to reach fishermen is just before the onset of a well-predicted storm. Fortunately for the fishermen, no such storm occured during the time when interviews were

being conducted). A few fishermen were operating out of other ports during the study and were unreachable, a few had no phones or permanent mailing addresses, and a very few were simply unwilling to be interviewed. Finally, the situation in commercial fishing is always fluid and there were several changes in ownership during the study with some people entering the business and others pulling out.

Following the initial round of contacts in person or by phone, each willing fisherman (most) was recontacted by phone and asked specific questions regarding his vessel characteristics, its operational data, and his personal opinions regarding the current situation and possible future action in the harbor. The actual list of questions asked was not identical for each vessel owner contacted but rather evolved as the survey progressed. In general, the questions shown in Table IX.2.2.1 were asked of most participants. Information was directly collected for 32 vessels and indirectly for 10 others. The most useful technique proved to be (as previously noted) by telephone after working hours or on weekends with the consultant first reviewing the background of the study and its purposes for the respondent, then explaining that he was conducting a telephone survey that would take perhaps 15 minutes, then asking the questions and recording the answers, and at times answering questions posed by the respondent. The vast majority of people were very willing to spend the time required, were candid in their responses, and in general were most cooperative. The extent to which this cooperation was attributable to prior consultant contact and

Table IX.2.2.1

COMMERCIAL FISHING SURVEY

A. Physical Data

Vessel Name _____ Number _____ L ___ B ___ D ____
Hull Material _____ Year Built _____
Main Engines _____
Gear Type and Size _____ Hold Capacity _____
Fuel Capacity _____ Certified for Passengers? ___

B. Operational Information

Season Fished From _____ To _____
Species _____
Trip Frequency _____ Length _____ Steaming Time ____
Usual Load/Unload Time _____
Average Landings per Trip _____
How is catch sold; where; to whom; at what fee structure? _____
_____
Where is catch landed? _____
Supplies per Trip Ice _____ Bait _____ Fuel _____
Number of Crew ____ Mooring Location _____ Cost _____

C. Opinions

1. What change or improvement in commercial fishing would you most like to see in the harbor area? _____
   Second choice _____
   Third choice _____
2. If these improvements were made, what specific effect do you think it would have on your operations? _____
   How many Newburyport/Salisbury owned boats do you think would be immediately attracted back to here by these improvements? _____
   From what ports? _____
3. What percentage of your annual income do you derive from commercial fishing? _____
4. If a storage facility for fish were locally available, would you regularly use it? _____
   How much do you think it would affect your average ex-vessel price? _____
5. How much would you be willing to pay for a year-round slip? _____ Mooring? _____
6. Assuming fish stocks improve or stay the same, do you expect to be fishing five years from now? _____
   With what kind and size of boat? _____
   From what port? _____

desire on the users parts to express his/her views that improvements should be made is unclear, but in another unassociated survey recently conducted by the consultant, the respondents were considerably less cooperative.

As an observation for future harbor work, it should be noted that on the average, the surveying time averaged nearly an hour per response. It is felt that approximately 75% of the potential commercial harbor users were surveyed, and to contact the remainder would have been either very difficult and time consuming or next to impossible. The preliminary meeting/telephone interview and follow-up telephone survey technique seems to be a successful and relatively efficient method of gathering information at this level of detail.

Table X.2.2.2 shows the physical data and operational patterns for the 32 vessels whose owners were contacted during the survey, as well as some rather sketchy information that was picked up by hearsay on ten other vessels. Among other things, the survey showed that the winter fleet of locally owned boats, as presently constituted, consists of 9 vessels of 395 feet combined length who berth here and an additional 8 vessels of combined legth of 350 feet who berth elsewhere because of the adverse winter conditions in the Merrimac. No charter or party boats operate in winter. In summer, all of the locally owned boats come home and several others come out of dry storage or wet storage in other ports so that the summer fleet of commercial fishing boats is 26 boats of over one thousand feet combined length plus 13 party and charter boats according to the survey. Allowing for the fact that the

Table IX.2.2.2

COMMERCIAL FLEET PHYSICAL DATA AND OPERATIONAL PATTERNS

Vessel No.	Length, ft.	Draft, ft.	Age, yrs	Hull Mat'l	Consider new home port?	Consider new size vessel?	New size	WINTER OPERATION: Fishery & Port	Trips/wk	Length, days	CO & Crew	Ice, lbs	Fuel, gal	Landings, lbs	SUMMER OPERATION: Fishery & Port	Trips/wk	Length, days	CO & Crew	Ice, lbs.	Fuel, gal	Landings lbs
1	46	4	18	Wood	No	No		trl-Mri	*2	1	2	0	250	*1000	trl-Mri	*5	1	3	375	250	*1000
2	24	1.5		FRP	No	Yes	45	gil-Sbr	3	1	1	0	10	500	gil-Mri	6	1	1	75	10	500
3	36	3.5		Wood	No	Yes	45	lob-Sbr	2.5		1	0	10		trl-Mri	*5		2	*750		
4	34	4	28	Wood	No	Yes		lob-Sbr	1.5	1	1	0	20	20	lob-Mri	*5		2	0	20	25
5	40	3.5	8	Wood	No	No		lob-Sbr	2.5		2	0	40	40	gil-Mri	5		4	*1500		1000
6	35	3	3	FRP	No	Yes	65								trl-Mri	3	1	2	75	20	350
7	36	3.5	0	FRP	No	No									cht-Mri	5	1	2	0	*40	
8	40	4.5	14	Wood	No	Yes		gil-Glo	3	1	5	0	70	*3000	gil-Mri	4	1	5	1500	70	4000
9	62	4	17	Wood	No	Yes	65								pty-Mri	14	½	4	120		
10	65	4.5		Wood	No	Yes	65								pty-Mri	*7	1	5	120		
11	36	4	6	FRP	No	Yes	44								trl-Mri	3.5	1	2	150	55	3500
12	63	4.5	20	Wood	No	Yes	65								pty-Mri	5	1	4	0	50	
13	59		7	Wood	No	No									pty-Mri	5	1	4	0	90	
14	28	2	12	Wood	No	Yes	50								tun-Mri	5	1	3		30	
15	62	3	15	Wood	No	No									pty-Mri	14	½	2	20		
16	48	3	22	Wood	No	Yes									pty-Mri	2.5	1	2	20		
17	31	3	6	FRP	No	No									lob-Mri	5	1	1	0	35	75
18	37	3.7	0	FRP	No	No		lob-Sbr	*2	1	*2	0	*50	*75	lob-Mri	*5	1	*2	0	*50	75
19	36	4	31	Wood	No	Yes	40								cht-Mri	5	1	2	200	35	
20	26	2.5	5	FRP	No	No									cht-Mri	14	½	1	0	12	
21	35	3	3	FRP	No	Yes	60	trl-Mri	2	1+	3	0	100	1250	trl-Mri	*4	1+	2	650	100	1250
22	36	3.5		Wood	No	Yes	72								tun-Mri	5	2				
23	62	8.5	1	Wood	No	Yes	42	scl-Glo	1	3	5	1400	400	1200	swd-Mri		8	7	18000	1200	10000
24	48	8	8	Wood	Yes	Yes	65	trl-Mri	4	1+	4	2000	400	6000	trl-Mri	*4	1+	*4	4000	400	*6000
25	42	4		Wood	No	Yes	65	trl-Mri	2	1+	3		60	2250	trl-Mri	3	2	3	3000	60	2500
26	45	4	24	Wood	No										cht-Mri	2	1	2	0	20	
27	40	4	11	Wood	No	Yes	60	lnl-Mri	2	1	4	1000			lnl-Mri	5	1	4	1000		
28	43	4.5	3	Wood	No	Yes	60	trl-Mri	*2	1	3	0		*2000	lob-Mri		1	3	0		
29	37	6		Wood	No	Yes	50	trl-Mri	2	1+	2		60	1500	trl-Mri	*4	1+	2	750	60	2000
30	65	6		St'l	No	No		trl-Mri	1	1+	2	300		3500	trl-Mri	2.5	1	2	900°		2000
31	65	5.5		Wood	No	Yes	100								pty-Mri	*7	1	3	200	200	
32	34	3.5	18	Wood		Yes	110								tun-Mri	2	1	2	0	35	
101	68			Wood				scl-Glo	1	3	5	1400	400	1000	swd-Mri		8	7	18000	1200	10000
102	42			Wood				trl-Mri	2	1+	3	0	50	3500	trl-Mri	4	1	3	750	50	2000
103	30														trl-Mri						
104	40														-Mri						
105								-Mri							-Mri						
106	45														cht-Mri	*2					
107	36														cht-Mri	2					
108	45														cht-Mri	2					
109																					
110															cht-Mri	2					

trl-Otter trawl
gil-Gillnet
lob-Lobster
cht-Charter
pty-Party
scl-Scallop
swd-Swordfish
tun-Bluefin Tuna
lnl-Longline

Mri-Merrimack (Newburyport and Salisbury)
Sbr-Seabrook and Hampton
Glo-Gloucester

* indicates estimate by owner or consultant
100 series was unavailable for interview

survey does not include all boats in the area, we estimate that the total commercial fishing fleet in the study area is of the order of 35 boats in summer with direct employment of approximately 120 persons. Neither of these figures includes the many part time summer fishermen, nor of course the many indirect jobs provided by this industry.

Table IX.2.2.3 shows the main results of the opinion section of the survey. The commercial fishermen are clearly most concerned about the lack of an unloading facility while the party and charter boat operators are more concerned about such things as the mouth of the river conditions and the aids to navigation. Surprisingly, one summer commercial operator saw no need for improvements. Of the 21 respondents to the question of whether vessels would be attracted from other ports, two were negative, four offered no opinion, and fifteen thought more vessels would come here with estimates of numbers ranging from one to twelve.

The question regarding replacement plans was answered by 22 commercial fishing boats and ten party or charter boats, and showed a clear trend in desire for larger boats. Of 15 respondents in the winter fishing category, 73% are planning or would like to replace their vessels, and, if they did so, the average length of boat would go from the present 41 feet to 54 feet. Among the summer-only commercial fishermen, 71% would like larger boats which would raise the average length from 34 feet to 58 feet (one response was excluded because the intended replacement size of 110 feet was felt to be completely unrealistic under present circumstances). The party and charter boats presently average about 58 feet in length and 50% are contemplating change for a new average length of 67 feet.

Table IX.2.2.3

COMMERICAL FISHERMEN OPINION SURVEY RESULTS

Vessel No. and Nature of operation	Ranked Negative Characteristics of Present Harbor			Would operators from other ports be attracted to harbor	
	Primary	Secondary	Tertiary	Yes	Rye
1 w&s comfish	No good unloading place				
2 w&s comfish	No good unloading place	No local buyer for catch			
3 w&s comfish	No ice-free moorage	No good unloading place			
4 w&s comfish	No good unloading place	Bad conditions at bar	Insuf.traffic control	Yes	6 Seabrook
5 w&s comfish	No good unloading place	Bad conditions at bar	Insuf.traffic control	Yes	6 Seabrook
6 sum comfish	No good unloading place	No ice-free moorage			
7 sum charter	No good unloading place	No ice-free moorage			
8 w&s comfish	No good unloading place	No ice-free moorage		Yes	Gloucester
9 sum party	Bad conditions at bar	Insuf.Aids to Navigation			
10 sum party	Bad conditions at bar	Insuf.Aids to Navigation			
11 sum comfish	Bad conditions at bar	No good unloading place			
12 sum party	No boat display place			Yes	3 Gloucester
13 sum party	No boat display place			Yes	3 Gloucester
14 sum comfish	No local bait supply				
15 sum party	Commercial overfishing	Insuf.Aids to Navigation	No local hotel		
16 sum party	Commercial overfishing	Insuf.Aids to Navigation	No local hotel		
17 sum comfish	No local bait supply	No good unloading place		No	
18 w&s comfish	No local bait supply	No good unloading place		No	
19 sum charter	No good unloading place	No ice-free moorage	Bad conditions at bar		
20 sum charter	Insuf.traffic control	Insuf.sewage treatm't			
21 w&s comfish	No good unloading place	No ice-free moorage		Yes	Rye
22 sum comfish	None				
23 w&s comfish	No good unloading place	No ice-free moorage		Yes	3 Gloucester
24 w&s comfish	Bad conditions at bar	No ice-free moorage		Yes	12 Gloucester
25 w&s comfish	No good unloading place	Insuf.Aids to Navigatinn	No ice-free moorage	Yes	3 Seabrook
26 sum charter	No good unloading place				
27 w&s comfish	No good unloading place			Yes	3 Seabrook
28 w&s comfish	No good unloading place			Yes	3 Seabrook
29 w&s comfish	No good unloading place	Insuf.Aids to Navigation		Yes	Gloucester
30 w&s comfish	Insuf.Aids to Navigation			Yes	1 Gloucester
31 sum party	Bad conditions at bar	No boat display place	No local hotel	Yes	N. Shore
32 sum comfish	No good unloading place	Bad conditions at bar			

w&s-engaged in year round operations
sum-operates in summer only
comfish-one or more commercial fisheries

One of the more striking results of the survey of commercial fishermen was the level of production (catch) for the Merrimac fleet. As we have noted previously, the public awareness of local fishing activities is very limited, yet in both number of people employed and contribution to net local income, commercial fishing and related marine operations have to be classed as a major local industry. The quantitative importance of this industry will be discussed in the following section, but the weekly groundfish landings in Newburyport/Salisbury range from 40,000 to 100,000 pounds depending on the season.

Chapter X: DEVELOPMENT OF THE NEWBURYPORT/SALISBURY HARBOR

X.1 Development Constraints

In formulating alternative development plans for the study area, the study team placed itself under certain general constraints, some physical and some arising from other considerations.

Initially, the geographical bounds of the study area were set at the mouth of the river on the easterly side and the Interstate Route I-95 bridge on the up-river or westerly side. As the waterfront properties between these two boundaries were examined in some detail, however, it became clear that the actual extent of waterfront that could be reasonably impacted by this development plan is in fact, much more limited.

In order to show just how limited the development area is, we will briefly discuss each portion of the waterfront as shown in the aerial view on the cover of this report and the plan view of Figure VII.1.1.

On the Salisbury side, the land just inside the jetty, upriver to Black Rock Creek, is a camping and boating reservation owned and operated by the State and thus is not a reasonable candidate for redevelop-ment for other recreational uses or for commercial uses. The area from Black Rock Creek upriver to approximately Coffin Point is almost entirely tidal wetland and inter-tidal flats. It would be expensive and difficult to develop this land because of the ground conditions;

there are no access roads of any consequence; and the flats are capable of economically important shellfish production once the pollution levels are reduced via proper sewage treatment on both sides of the harbor. Beyond these purely technical and economic reasons, however, any attempt to develop these wetlands would face enormous counter-pressure from environmental groups, both local and otherwise. These are ecologically very active wetlands that serve as feeding and nesting areas for both indigenous and migratory birds, and the area in front of this shore is perhaps the best fishing area in the river. (Several years ago, a Ross' gull, an extremely rare North American bird seldom seen outside of northern Alaska, spent several days in this area and on the flats across the river in Newburyport. It was " an event" in bird watching circles and it attracted bird watchers from all over the United States and there were even reports of a few persons coming here from other countries. The appearance of this single bird and the subsequent appearance of literally hundreds of dedicated bird watchers received national news coverage. Unfortunately, the lack of overnight accomodations in Newburyport and the river area of Salisbury meant that the vast majority of these visitors were here only for a few hours or a day, so the full economic potential of this "boomlet" of tourism was never realized by either community).

The Salisbury side from Coffin Point to the Route 1 bridge is shown with Newburyport in the foreground in Figure X.1.1. This is the only active part of the

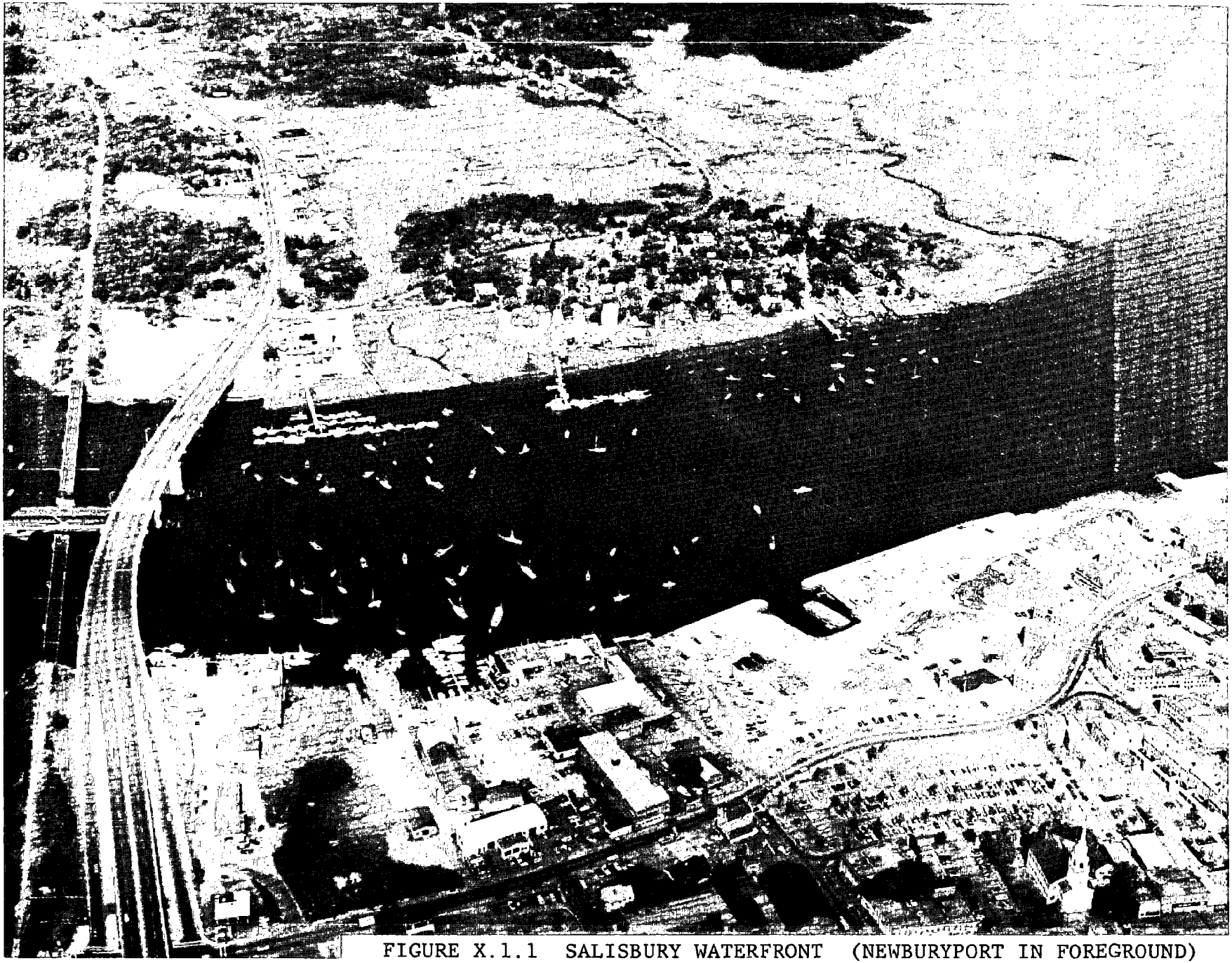


FIGURE X.1.1 SALISBURY WATERFRONT (NEWBURYPORT IN FOREGROUND)

Salisbury waterfront and includes marinas and some residential properties as well as a large parcel of presently unutilized land. The cluster of residences in this area is known as Ring's Island. This part of the Salisbury waterfront is already developed to a degree. There is at least one further development being planned by private interests; and this is the most likely area for further development, either private or public.

There is another small parcel just upriver of the railroad bridge that has been bulkheaded in wood and has been approved by local authorities as a marina. It is currently undeveloped, but could become a small operating marina quickly and with only limited investment. From this point to the town limits, however, all of the remaining riverfront in Salisbury is wetland and unlikely to be developed, so the practical limits of development on the Salisbury side are from Coffin Point to the parcel just above the railroad bridge.

On the Newburyport side, the area at Plum Island Point is the former site of the U.S. Coast Guard Merrimac River Station and has been declared surplus property by the General Services Administration. It is a sandy beach and dune area, not very popular for swimming, but frequented throughout the summer by surf-casting fishermen on both sides of the jetty. Both the City and the State have expressed interest in the property for preservation as recreational land. Commercial fishing facilities or recreational boating facilities at this location would be extremely expensive

to implement and would still be relatively exposed to wind and sea, especially in the winter months. Beyond that, establishment of either type of facility here would mean either a new and separate focus of water related activities or a massive dislocation of the current center of activities near the central business district. Among other problems, Plum Island is connected to Newbury and Newburyport proper by a single road which can become impassable in severe weather, so this area was not considered suitable for another harbor development.

The area between the Point and the beginning of the turning basin near the American Yacht Club is known as Joppa Flats (see Figure X.1.1), and consists of the largest and most productive shellfish area in the harbor. In view of the economic and environmental importance of this area, further development is nearly impossible. (As an indication of the seafaring traditions of Newburyport, local legend claims the word Joppa is a corruption of Yafo or Jaffa, the Mediterranean port that is now part of the harbor of Tel Aviv. It is not clear when or how the name got transplanted to Newburyport, but in current usage, Joppa still refers to the part of the city nearest the clam flats).

The developed part of the Newburyport waterfront begins at about the point where the abandoned Boston and Maine Railroad right-of-way comes to the waterfront as can be seen at the bottom of Figure X.1.2. There is a short stretch of seawall facing on grassy tidal

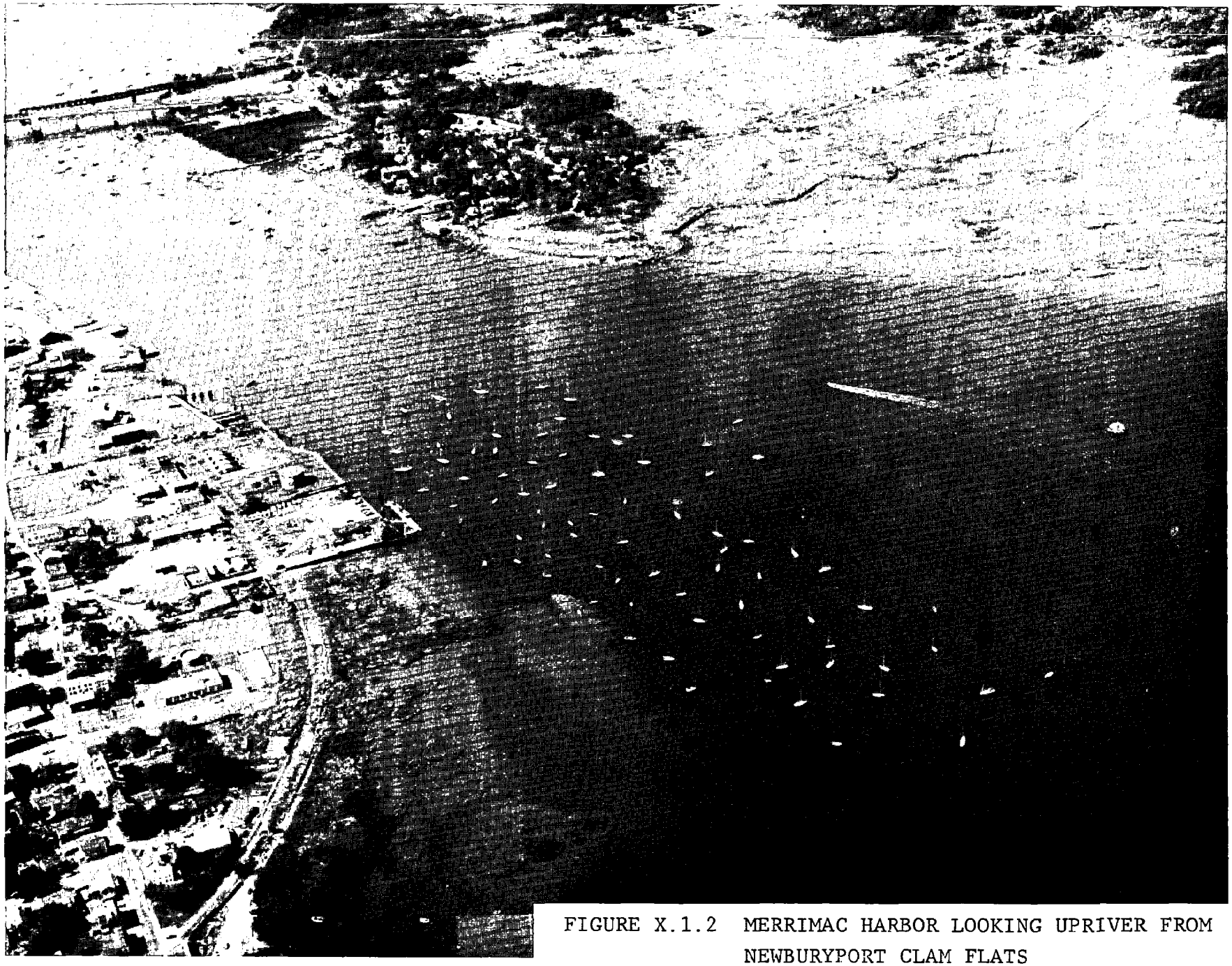


FIGURE X.1.2 MERRIMAC HARBOR LOOKING UPRIVER FROM NEWBURYPORT CLAM FLATS

flats just downriver of this point, and the parcels immediately upriver are residential and light industrial with no need or present use of the waterfront itself. The existing sewage treatment plant is the next parcel, again with no need or use of the waterfront other than an easement for its discharge line whose presence is clearly evident at the shoreward edge of the mooring area.

The first waterfront parcel outside of the abandoned right-of-way is the American Yacht Club, followed by an oil storage depot (home heating oil), an electric substation with peak load generating capacity, and the new U.S. Coast Guard Merrimac River Station. The generating plant and the Coast Guard Station are evident at the extreme left of Figure X.1.3 and adjacent to the Coast Guard Station there are four parcels of land that had historically been one of the busiest parts of the waterfront, but are unused now, though they have some piers and bulkheads in various states of repair and disrepair. Figure X.1.3 clearly shows the newly constructed bulkhead on which a waterfront park will be constructed by summer of 1978, and the redeveloped central business district in the background. Upriver of the new bulkhead begins the most highly developed and highly used portion of the waterfront, containing several marinas, restaurants, and marine supply retailers.

Beyond the Route 1 and railroad bridges, there is a large parcel of public land, Cashman Park with its

public boat ramp and a small pier; a large factory; the North End Boat Club; a large expanse of unused land (except for a small marina and boatyard that is building steel fishing vessels); three marinas that are nearly adjacent to each other; and full residential properties from this point (the bottom of Figure X. 1.4) onward to the Route 95 bridge, except for another small stretch of parkland.

From all of this, it seems clear that the limits of the development plan for the Newburyport side are the beginning of the waterfront portion of the railroad right-of-way on the downriver end to the last marina on the upriver end, though the main area of interest goes only as far upriver as the Route 1 bridge.

Physical constraints arise further from the depth and width of the channel, primarily the former and primarily near and at the mouth of the river. The conditions at the mouth remain the major physical constraint of the harbor and, barring a major capital dredging project coupled with significant jetty modifications, the largest vessels that can be serviced here are the largest that currently call here, 65 foot draggers drawing up to 11 feet fully loaded. In fact, the largest draggers currently operating here draw less than 11 feet and the deepest draft boat, the one that draws nearly 11 feet, is only 45 feet long. It has a relatively deep and narrow hull, while the 65 footers are relatively shallow and beamy and draw about 8-9 feet. There is no direct formula to relate length and draft but a "reasonably proportioned" boat of perhaps up to

FIGURE X.1.3 NEWBURYPORT WATERFRONT FROM COAST GUARD STATION TO URBAN RENEWAL AREA

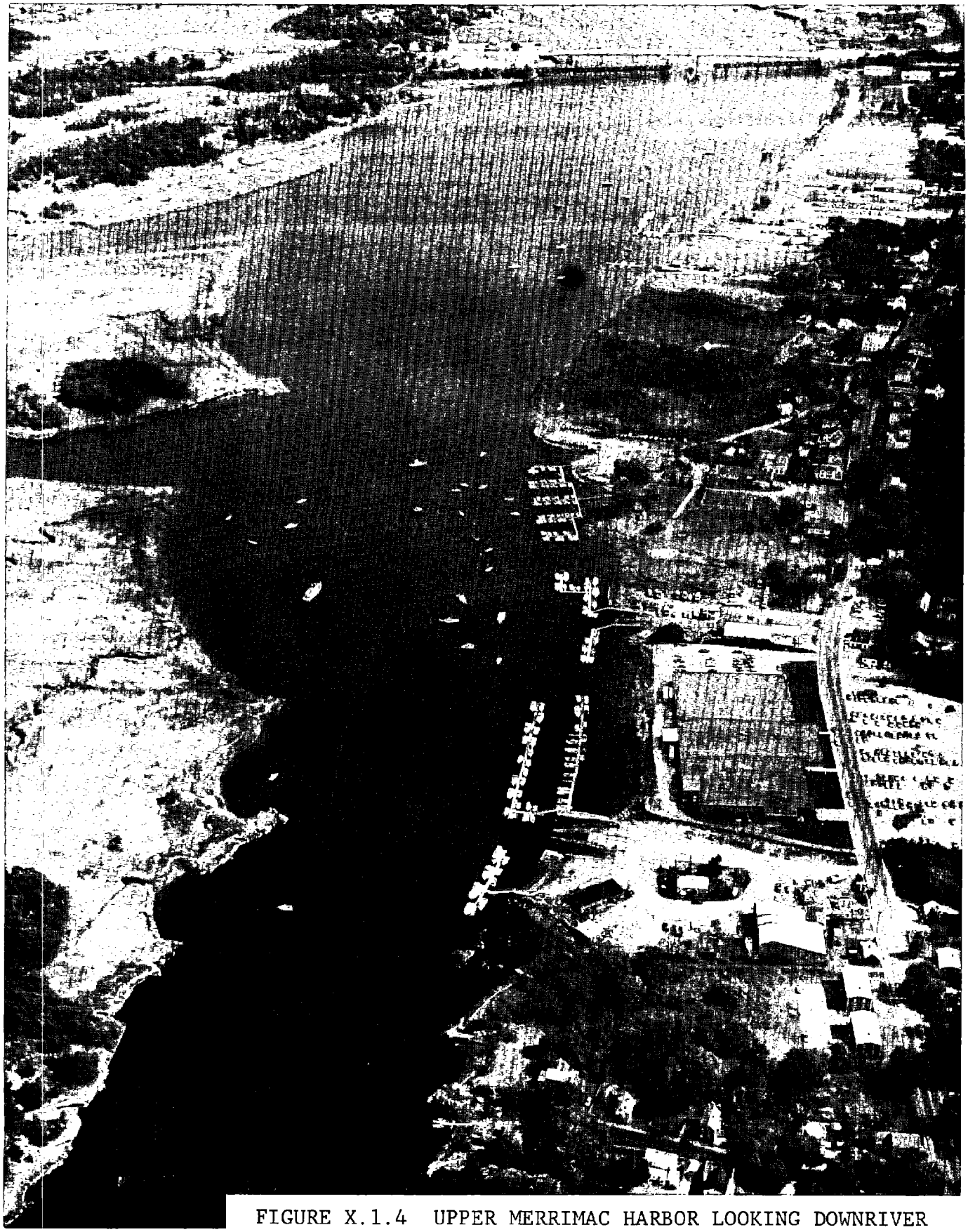


FIGURE X.1.4 UPPER MERRIMAC HARBOR LOOKING DOWNRIVER

80 feet in length can be designed to draw 11 feet or less. Beyond that length, the design would have to be quite beamy, perhaps excessively so, to have a draft less than 11 feet. It is possible that such a standard class of boat could be designed and built in the future, but based on current practices, the depth at the bar effectively limits the size of boat to be considered here to about 65-80 foot maximum.

Aside from these basically physical limitations and the broad land use constraints, the study team also restricted itself to development plans that were consistent with perceived local goals and objectives. Additionally, certain other constraints that were considered to be implicit rather than explicit goals and objectives were imposed on the study. Admittedly, some of these latter constraints were somewhat judgemental while others were simply based on sound land management planning practices.

In general, it was determined that development plans should be consistent with the general tenor of the communities at large and, in particular, with the traditional uses of the harbor and the more recent uses embodied in the renewal and revitalization of the central business district on the Newburyport side. As we have already shown, both communities have a strong tradition of the sea, and fishing and other waterborne commerce have been instrumental in the growth and development of the area since pre-revolutionary times. More recently, both communities have had heavy tourist

traffic related to fishing and other recreational boating and have derived substantial regional income from these sources.

The renewal area in Newburyport has been designed and implemented with these traditions in mind and the facades of the renewed buildings reflect the ambience of a busy commercial port of a century or more ago. While a restoration of the harbor to its former status as one of the busiest ports of the Northeast in colonial times is clearly out of the question, nonetheless, a restoration of the commercial fishing business would not only be consistent with the general ambience of the renewal area, but would be an addition to it as well.

The area would become more attractive to visitors if the work of landing and handling fish became more visible, more real, and more obvioulsly a part of the life of the harbor. It is interesting to note that in all of the discussions with local residents, there was almost universal acceptance that such an atmosphere would be attractive to visitors and residents alike and would be a positive addition to the area. The only individuals who expressed caution that it might detract from the harbor were a few fishermen who were concerned that the sight of their rather utilitiarian vessels and the smell of the fish might prove unattractive to recreational boaters and other tourists. Based on the comments of most others contacted, and in the opinion of the study team, exactly the opposite is true.

Nonetheless, it was felt by the consultants that too close intermingling of commercial fishing and recreational boating would be inappropriate and to the mutual detriment of both groups. We have already discussed the problems faced by fishermen in trying to land their catch at what are primarily recreationally oriented marinas and it was felt that recreational boaters would be equally displeased with servicing their boating needs via a working fishing dock which, while it may be picturesque when one cruises past it or walks near it to watch the catch being unloaded, may be less that picturesque at close range and if it is the only means of boarding and provisioning a new cabin cruiser with wall-to-wall carpeting. Accordingly, it was decided that, insofar as possible, development plans should separate the commercial fishing activity from other boating activities, but not to the point of making them mutually inaccessible. Put another way, it was felt that the commercial fishing activities should be physically separate from other activities in the harbor and town, but that all of the activities should be conceptually compatible as complementary parts of the overall life of the harbor and the communities.

Both of the communities involved are small communities with a high percentage of long term and native residents. As such they are rather close-knit communities with extensive networks of familial relationships and acquaintances. Because of this it was felt that the search for possible development plans should concentrate on plans for which benefits were clear and

broad and for which any disbenefits would be limited and either diffuse or indirect. In particular, though one of the clear mandates to the study team was to develop plans to assist commercial fishing, it was decided that this should be done, insofar as possible, in a way that would not directly threaten any other current user or beneficiary of the harbor by, for example, recommending public domain takings of currently operating marinas or attempting to convert current or future public recreational lands such as Cashman Park or the new seawall to restricted commercial use. The study team imposed on itself the constraint of respecting current waterfront land uses and seeking to augment them while at the same time expanding commercial fishing operations.

X.2 General Harbor Developments

X.2.1 Short Term

There is an immediate and continuing need for improvements at the mouth of the river for the benefit of both commercial and recreational interests, and it should be underscored here that the benefit to which we refer is simply the safety of boats and their passengers.

The Army Corps of Engineers did conduct a maintenance dredging project at the mouth this year, in the spring and summer of 1977, and it has improved the bar conditions and will permit easier passage during moderate weather conditions of the 1977-1978 winter fishing season. Experience in the past indicates, however, that new shoaling will occur in this area and continued maintenance dredging will be required within two to three years until and unless more permanent structural changes of the mouth are implemented.

In the meantime, however, local officials and the appropriate members of the Massachusetts Conressional Delegation should continue to prevail upon the Coast Guard to install proper navigational aids at the mouth. In particular, the existing ends of the jetties should be marked. At a minimum, the marking should be radar reflectors and day beacons; but in the view of the potential danger inherent in these jetties, marker lights are all but essential for safe entry at night or in weather conditions of reduced visibility.

The north jetty is not straight but rather extends roughly southeast from the beach for about half its length and then breaks to nearly due east for the remainder of its length. Depending on the precise placement of buoys between the jetties, the apparent channel can run quite close to this break and the jetty corner could prove hazardous, particularly to a visitor unfamiliar with the harbor. In fact the placement of buoys during 1977 was such that a boat steering a course directly from Red Buoy No. 6 (just between the ends of the jetties) to Black Buoy No. 7 (just off the point where the north jetty joins the beach) would stand an excellent chance of striking the north jetty at the break. When one further considers that the jetty is nearly submerged at high tide and that localized fog near the mouth is not uncommon during the summer, it becomes clear that some sort of marking is needed at the break in the north jetty. Again, a lighted marker would be best, but a radar reflector day beacon is needed at a minimum.

Within the harbor itself there are a number of shoal areas and tidal flats that are quite close to the marked channel and present a hazard to boats of any significant draft, say over two feet, if they stray from the channel even slightly. In fact, there are some areas where the shoals lie in the channel itself or immediately adjacent to it so that the larger boats that use the river can touch bottom on a very low full moon tide unless they stay nearly in the center of the channel. More and better maintenance dredging is

the indicated solution to this problem but in the short term, the placement of one or two additional buoys would help greatly both for locals and for visitors. In particular, the stretch of channel between Red Buoy No. 12 and Red Buoy No. 12A is nearly a mile long and has several spots on both sides of the channel that get very shallow on a low tide. An additional pair of buoys would break this long stretch and minimize the lateral effects of slight navigational errors at night or in fog.

A further problem with the buoys is that some are lighted while others are only equipped with light reflectors. As with many of the short term problems discussed thus far, this shortcoming presents a special problem to visitors unfamiliar with the channel, but even locals can have difficulty picking up these buoys at night or in fog. Lights on more buoys or all buoys would significantly add to the attractiveness of the harbor to recreational boaters. The channel markers are especially inadequate in winter when several of the lights are removed because of the danger of ice damage. Given the weather and the fact that commercial fishermen always make one leg of each trip in darkness, this is a severe problem. The Coast Guard should be heavily encouraged to find a solution to this problem, such as placing larger buoys or protecting the lights with a lexan dome, but some solution must be found if the full commercial potential of the harbor is to be realized.

X.2.2 Long Term

The major long term development of general benefit to the harbor would be a solution to the conditions at the mouth of the river. The Army Corps of Engineers is conducting tests on the Merrimac River model at Vicksburg, Mississippi in order to determine what is technically and structurally possible and until these tests are completed and evaluated, we are in no position to make specific recommendations for a complete long term solution. Nonetheless, there are a few long term physical harbor improvements that seem obvious regardless of the test outcome.

The north jetty is in serious need of repair. Much of the outer end of the jetty has deteriorated to the point that it is submerged, and all of the jetty is so low that waves can and do break over it in a northeasterly blow at or near high tide. This can happen during moderate summer storms as well as the more severe winter storms. (The jetty is a popular fishing spot in summer, and people have been washed off when a large wave breaks over the jetty).

Inside the mouth, there are several long term developments that would substantially improve the harbor for all who use it. A capital dredging project designed to reduce the shoaling in and near the channel as well as a deeper maintained channel would be welcome improvements if the model tests indicate them to be technically feasible. Along with such channel improvements,

there are several areas outside the main navigational channel that have natural or manmade obstacles that limit the basin area and present serious hazards to boats that stray from the channel. Removal of these obstacles by blasting, at least the manmade ones, would be a significant harbor development. Among the manmade structures, the submerged (at high tide) abandoned jetty near the day marker at Block Rock Creek and the ruins of the South Pier near the American Yacht Club are the more obvious candidates. There are also natural formations in the same two areas that would not be missed by local boaters. The formations near the yacht club, Half-Tide Rocks, are evident in Figure X.1.2 and clearly a problem for the nearly 100 boats that moor in this area, most of them sailboats with relatively deep navigational draft.

As we have already discussed, the area available for the new development on either side of the river is quite limited and further major development of the shoreline will require long term channel and basin improvements. This will be discussed more in the section dealing with recreational boating development, but for now we will point out that the most logical place for new basin and channel dredging is the area just downriver of the sewage treatment plant on the Newburyport side and just offshore of the abandoned right-of-way (Figure X.1.2).

X.3 Commercial Fishing Developments

X.3.1 Short Term

The most pressing needs in the study area are a dedicated facility for the unloading and handling of commercially caught fish and a local source of broken or crushed ice in commercial quantities. Under ordinary circumstances, these needs would be met either through a major private investment or through a large public project invloving both local government and state and federal agencies for planning, funding, and implementation. Either route would normally be time consuming enough to be more properly called a long term development rather than short term.

In the instant case, however, a number of factors have combined to make a significant development in this area possible in the short term. In fact, the physical development is being implemented as this report is written (July 1977). The need for an unloading facility and an ice supply was clearly established early in this study effort and it became equally clear that the best hope for early solution to these problems lay in modifying existing underutilized or unused waterfront facilities rather than breaking new ground. Referring to the discussion of Section X.1, it was clear that the most likely area would be the presently unused waterfront between the new bulkhead and the Coast Guard Station on the Newburyport side. (See Figure X.1.3). This area consists of four parcels of land, one of which had been an operating marina with a dock and good deep water, but which is

presently unused and in a state of disrepair. A survey of the site revealed, however, that the dock could be refurbished quickly and at relatively low cost if the funds and a willing operator were available.

To meet both of the most pressing needs, however, additional funds were also needed for an ice making and storage facility. Fortunately, DCA became aware of the availability of a block of funds, $15,000, from the New England Regional Commission for high risk and high gain economic development purposes. Though this sum was insufficient to fully capitalize the needed facilities, this grant could clearly serve as seed money and as a catalyst for the full project. Accordingly, DCA and the consultant prepared an application to NERCOM on behalf of Newburyport, including a justification of the need and an analysis of the financial viability and market potential for the project based on our survey of commercial fishermen in the study area. NERCOM acted favorably on the grant application and the City of Newburyport responded by allocating, through the Office of the Mayor, $50,000 of its Community Development Entitlement funds from the U.S. Department of Housing and Urban Development.

Consistent with an earlier stated desire for benefits from harbor development to be as broad and diffuse as possible, the study team recommended and the City agreed that the operator of the facility should be a non-profit entity representative of the plant users and a fishermen's cooperative was the obvious choice

for such an entity. The Tri-Coastal Tuna Cooperative is a cooperative with members in Maine, New Hampshire, and Massachusetts but the largest concentration of their members is in the Newburyport/Salisbury area and, in another fortiutous circumstance, they were in the process of disposing of their facility in Portland and looking for a new facility in the Gloucester to Newburyport area. Tri-Coastal reacted favorably to the Newburyport proposal and, with the assistance of the City and the consultant, concluded a lease and refurbishment arrangement for the former marina property as a site for unloading fish and making, selling, and storing ice. Subsequently, bids were received and accepted by the City for an ice-maker; bids are being solicited for a building; and work is underway on the refurbishment of the dock. The full facility will be in operation by the end of 1977.

Figure X.3.1.1 is based on the existing assessor's maps for the City of Newburyport and shows the immediately adjacent parcels. Note that the waterfront parcels on both sides of the site are vacant. In fact the site is nearly in the middle of approximately 800 feet of waterfront that is vacant, was formerly used as wharves, and is zoned for heavy business use. The assessor's maps of the City are historically based and tend to be inaccurate with regard to the present form of the land/river interface, and that is true of the site in question; but the site does have well over 100 feet of piled pierface and could easily dock the largest boat in the local fleet for unloading and icing. The

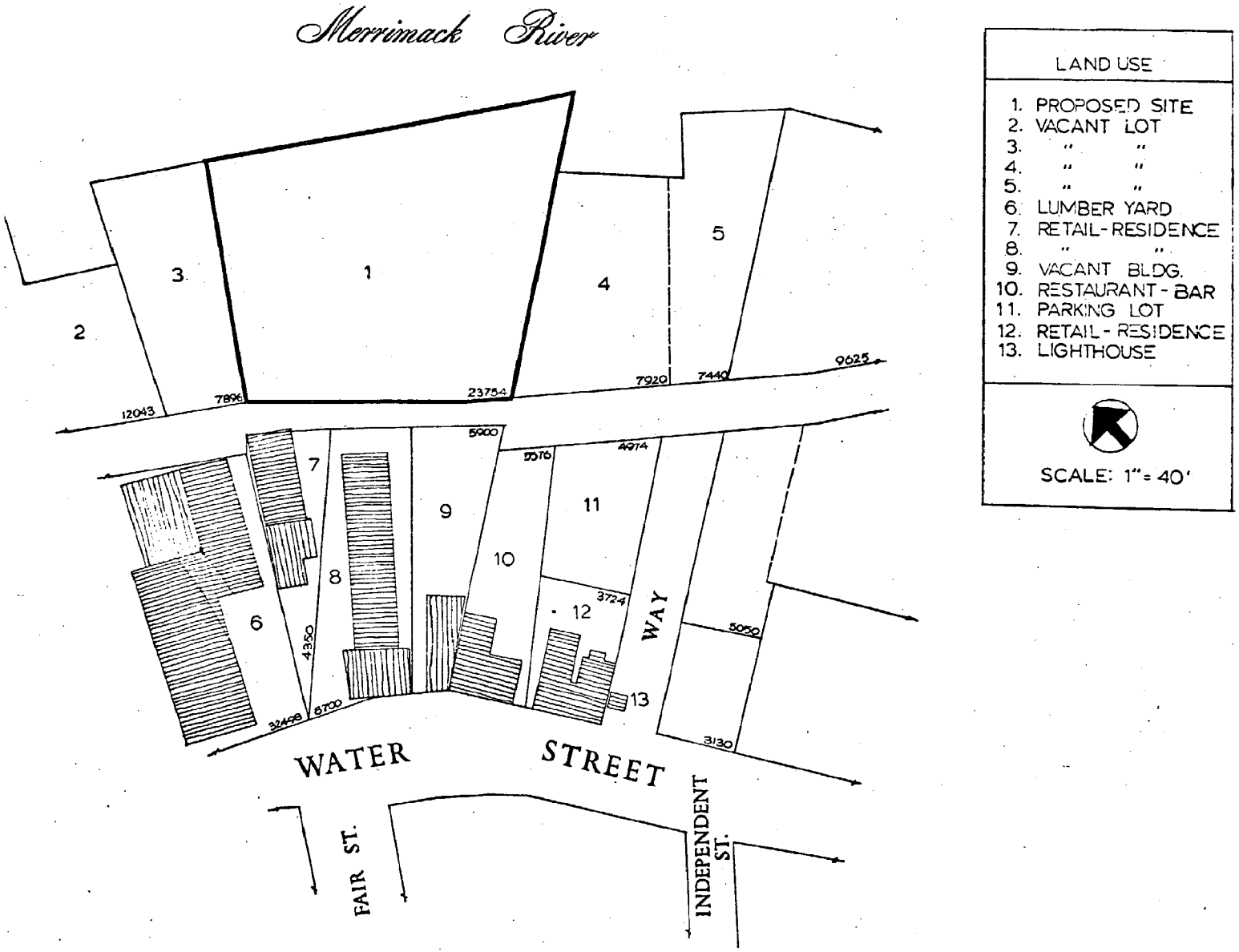


FIGURE X.3.1.1 LOCATION OF NEW ICE FACILITY AND UNLOADING DOCK

dock will be redecked and a hoist installed to handle fish, ice, and gear between the dock and the boats.

Under the terms of the agreement being considered by the City and the Cooperative, the facility will be available to all fishermen, members and non-members, and ice will be sold at prices consistent with the prevailing commercial prices to all members of the public. The City will retain ownership of the ice machine and storage building and will lease them to the Cooperative on a royalty basis.

X.3.2 Long Term

Though the above arrangement will meet some of the more immediate needs of the existing commercial fishing fleet in the study area, it will do so on only a limited basis and will not speak to some of the other pressing needs, most notably an ice-free and ice protected berthing area for winter operations. Moreover, the above arrangement, while marginally adequate to the icing and unloading needs of the present fleet, would not be able to service the needs of a significantly expanded fleet in any season.

In formulating a more ambitious long term development plan, the unmet needs of the fleet and the potential for increased economic impact of commercial fishing in the area are the driving force for the plan, but the previously discussed development constraints must be kept in mind. In particular, the desire to avoid disruption of existing harbor services and businesses and to locate the commercial fishing center in such a way as to complement the urban renewal area without negative impact suggests the presently unused parcels surrounding the ice/unloading facility as the most suitable location for long term commercial fishing development. This area has the several advantages of being unused at present, contigous with the short term development, within walking distance of the urban renewal area yet separate from it, formerly a highly commercial area of the waterfront, and adjacent to naturally deep water. Among the other presently unused areas on either side of the river, most are unsuitable either for environmental reasons or because they are too remote from the current

center of harbor activity. The few remaining have other factors which disqualify them. For example, the small parcel of City owned land between the new waterfront park and the private marinas upriver is simply too small. The land upriver of the bridges on either side of the river is barely large enough, but nearly all commercial boats would need to have the drawbridge opened to pass, and this would significantly increase the number of openings and would also require 24-hour, 365-day tending of the bridge to allow for the usual pre-dawn and post-midnight movements of the fishing boats.

A careful review of all sites on the river, based on our constraints, clearly shows the area in question, i.e. the Newburyport side between the waterfront park and the Coast Guard Station, to be the best for long term commercial fishing development. There are several forms such a development might take, each with its own set of advantages and disadvantages. On balance, however, the most suitable will be a pile supported pier arrangement extending into the river as indicated in Figure X.3.2.1.

The use of a structure extending into the river will provide an ice protected lee for winter berthing of fishing boats. A pile supported structure will assure that the flow patterns of the river will be only slightly affected, if at all, and will avoid creating new shoal points that could lead to an expensive annual maintenance dredging program. The upriver arm of the fishing pier is angled from the shore to deflect ice floes into the main channel where they can continue being carried to the mouth of the

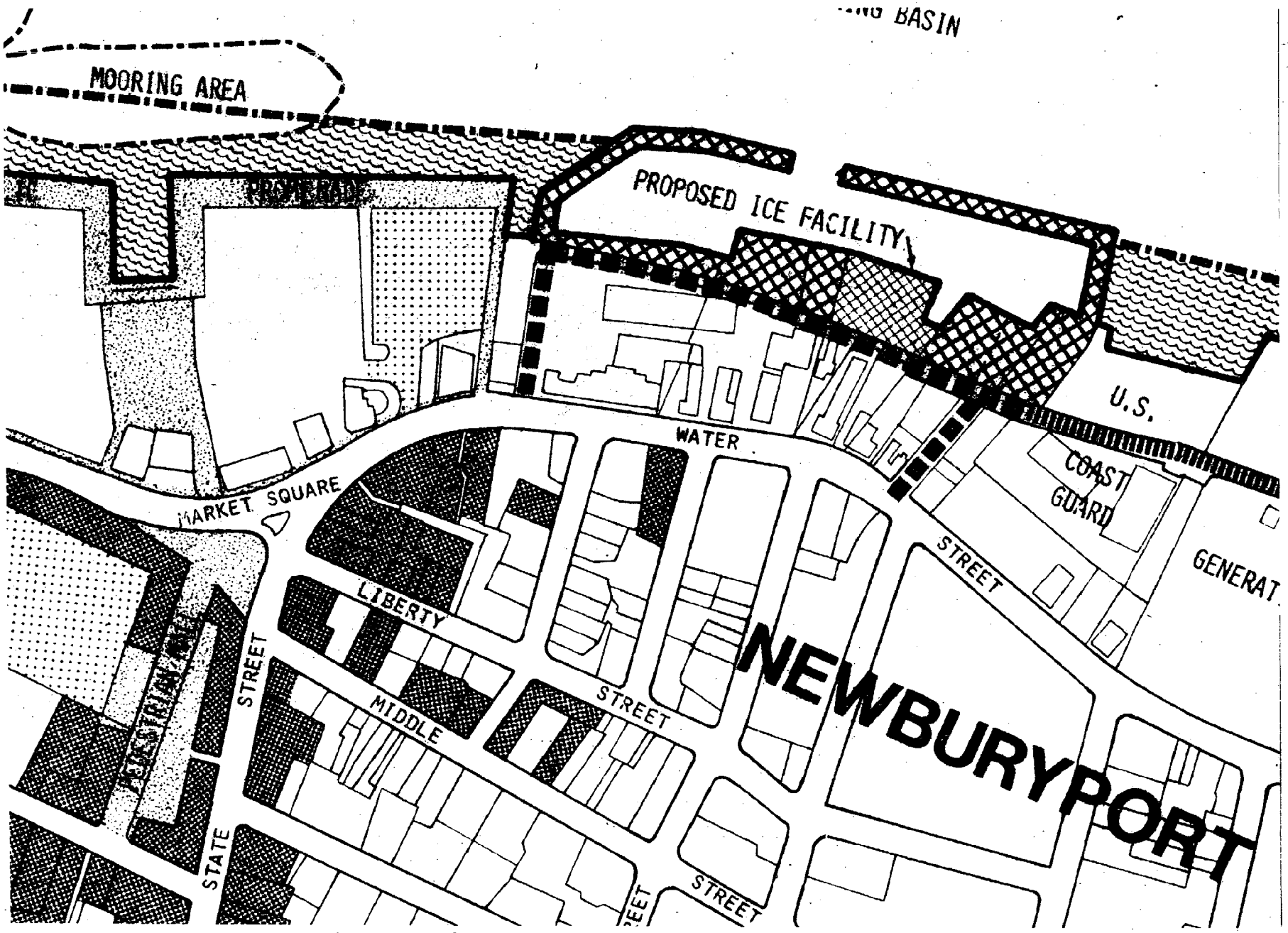


FIGURE X.3.2.1 PROPOSED COMMERICAL FISHING BASIN

river by the current. Aesthetically, this angled arrangement of the upriver end will permit the pier to be conveniently accessible to persons using the downtown area and the waterfront park, yet the pier itself will not dominate the view form the park.

The downriver end of the pier can be carried straight out from the shore to enclose the maximum amount of protected water area. Heavy ice movement upriver will occur, but less frequently than the downriver flow, and will usually consist of thinner and lighter ice floes. The immediately adjacent downriver property is the Coast Guard Station, so the aesthetic and public access criteria of the upriver end do not apply.

As Figure X.3.2.1 shows, the lateral extent of the proposed development is strongly dependent on the existing boundary of the U.S. Army Corps of Engineers turning basin and channel. In principle, no fixed structure is allowed to encroach on the basin and channel, but there are well established mechanisms for redefining the channel and basin boundaries if a greater need and higher use can be demonstrated. How much of an encroachment will be accepted by the Corps depends on the specific design and purpose of the structure and is a matter for some negotiation with the Corps. In the case at hand, we have shown only a very slight encroachment on the 400 foot wide channel, simply the 40 foot width of the pier itself, but we believe that more encroachment and a larger protected area may be possible when the detailed design of a pier is prepared.

The proposed pier would offer safe and secure berths throughout the winter for thirty or more fishing boats or slips, plus three unloading berths at the site of the short term ice machine and unloading pier. In summer, additional boats could be accomodated on floats outside the fixed pier and at its upriver and downriver ends. The upriver end would be adjacent to the new guest facilities for pleasure boats at the park, and would be a commercially attractive and aesthetically consistent location for party boats to be displayed, if not loaded and unloaded.

The actual width of the fishing pier will be determined in the detailed design phase after a more complete cost analysis, but we have shown it as 40 feet for the time being. This width will allow the multiple use of the pier that we feel makes it especially attractive. The minimum width for strictly commercial fishing purposes would be perhaps an eight or ten foot wide pedestrian walkway to the fishing boats. (In principle, a walkway is not absolutely essential since the piles provide the ice protection and the fishing boats could be accessed via floats). With a minimum width, however, the pier would be strictly limited to foot traffic and any movement of gear or supplies to or from the boats would have to be at the unloading dock. A wider pier could accomodate pickups and other light trucks as well.

A 13-15 foot width could accomodate single lane one-way truck traffic and, with several short wider sections for two-way bypasses and turnarounds, this would be adequate, though barely, for light truck access to the boats.

We are recommending the substantially wider pier, however, so that the pier can both serve the fishing community and would be an additional attraction to the public as well, both locals and visitors. A 40 foot wide pier would allow space for a single lane roadway for limited access by trucks; a pedestrain walkway so that visitors to the waterfront can observe commercial fishing and, possibly, charter and party boats at close hand; and an approximately 15 to 20 foot wide strip that would have several different uses along its length. Its most utilitarian function would be to allow periodic bypasses so that the single lane roadway could handle the two-way restricted traffic. Additionally, it would contain mini-parks with benches for pedestrians to relax and watch the many harbor activities as well as a limited amount of retail space, either for shops appropriate to the environment or restaurants or stands serving the local seafood.

The downriver arm of the pier is also shown with the 40 foot width, but because of its location and the distance of its entrance from the waterfront park and central business district, it will be much less attractive as retail space. Instead, the extra width of the downriver pier can be used for rows of fishermen's shanties, small storage buildings for storing nets, floats and other gear. As we have noted earlier in this report, most fishermen shift from one fishery to another through the course of the year and need storage space for their off-season gear. These shanties would be rented to the fishermen as part of their mooring fees.

X.4 Recreational Harbor Developments

X.4.1 Short Term

There appears to be a need for more marina and club facilities for recreational boating in the form of more slips, more moorings, and increased marina services in general, but the needs in this area are not so pressing as to require direct public action at this time. Nonetheless, public bodies in both communities should encourage and assist present and prospective marina operations and clubs to expand their facilities, subject to space and capital constraints, since the recreational boating section is and will continue to be a major contribution to the local economies during summer. A consolidation of commercial fishing activities at a new facility will add somewhat to the marinas' ability to serve the recreational market and, with the new waterfront park and public floats, will also tend to increase the overall growth of the harbor and demand for services.

In general, market forces and the private sector recognition of expanding or developing markets will provide all the impetus needed for short term development but there are a few areas where direct public action or initiative may be needed. At present, no marina or club in the area provides pumpout services for pleasure boat sanitary holding tanks. Most of the boats using the harbor continue to use direct discharge sanitary facilities, either under grandfather clause exemption from existing regulations or

in necessary violation of them because of the lack of a local pumpout station. In view of the current state of affairs with the municipal sewage of the two cities and the fact that very few boats are used for overnight accomodations in the harbor, boating discharges of sanitary wastes represent an insignificant contribution to the overall pollution levels in the harbor. The former problem is being solved and, as more and more cruise traffic is attracted to the area and more people are being on board, the problem of sanitary discharges from boats will increase in both a relative and absolute sense. At present, however, the market forces alone have not induced any marina to install a pumpout facility, and either direct or indirect local action appears to be needed. Direct action would mean City or Town construction and operation of a pumpout facility and, realistically, the only approporiate place would be at the public boat ramp at Cashman Park on the Newburyport side. Indirect action would be to require that any new marina include a pumpout station in its design and require that any significant modification of any existing marina also include the addition of a pumpout station.

The mooring areas currently in use are relatively filled and in some areas are encroaching on the channel. One area that does not yet have many moorings is the area in front of the new waterfront park. There are at present only a limited number of privately-owned or marina-owned moorings in this area, mainly because it had been an undesirable location when the adjacent waterfront was unused

and contained only unsightly and unusable dock ruins. With the new bulkhead and floats, however, it has become a decidedly more attractive spot as the increase in mooring permit applications will attest.

In order to get maximum community benefit from the bulkhead and waterfront park the City should consider limiting or prohibiting individual or marina-owned moorings in this area and instead installing publicly owned moorings to be used in the same manner as the public slips at the bulkhead.

Moorings are a relatively inefficient use of water area and the very congested nature of the Merrimac in summer presents quite an obstacle course to boaters, both recreational and otherwise. Furthermore, the space available in the convenient and desirable parts of the harbor is rapidly diminishing with the increasing demands by new boat owners or boat owners who want to change from trailering to mooring for its greater convenience. Increased scarcity of suitable mooring sites is likely to continue.

Greater control by the harbormasters could help the problem somewhat by permitting more careful overall harbor planning of mooring placements to obtain more efficient space utilization. At present, although the harbormasters exercise nominal control over mooring placements, this is really just a formality and few mooring applications are turned down or modified unless the requested site is grossly inappropriate such as, for example, locations that impede

access to and from the Coast Guard Station and might thus interfere with patrol boats on boating assistance missions. In fact, the main function of the mooring records at present is to have a central local record of who owns what boat in case the craft is in danger or improperly placed or is the object of vandals or thieves. The two communities should empower their harbormasters to develop an overall mooring plan that will more efficiently use the available space and specifically assign spaces that are consistent with that plan. In all probability, few of the current moorings would be seriously affected by such a plan, though some may have to be moved slightly, and the main impact could be limited to the placement of new moorings.

Consideration should also be given to radically new and novel solutions to the mooring space problem. In particular, it may be possible to place mooring rafts in the harbor, essentially free floating slips that are not connected to the shore. Such a mooring raft would be nothing more that a string of typical marina floats, but rather than being attached to a pier or other floats at the marina, it would be moored at both ends so it doesn't rotate with changes in wind and current, and boats would tie alongside it as they would alongside a shoreside float. In this way, as many as six to ten boats could be stored in the same water area that would be needed for only one or two using conventional mooring arrangements. The boater would have the advantage of the relatively lower cost of a mooring vis-a-vis a slip since the most valuable and scarce shoreside space would not be used, yet he would have at least some of the safety, for his passengers, and convenience of a slip.

The logical owners and operators of such mooring rafts would be the marinas and clubs but because it is rather a novel and untried approach, it would be reasonable for the communities themselves, perhaps through the harbormasters, to install at least one such raft as a demonstration and test of the concept.

X.4.2 Long Term

There are still a few areas of the waterfront on both sides of the river where the shore and adjacent water are suitable for marina development through strictly private initiative. The parcel immediately upriver of the railroad bridge on the Salisbury side is one area and there is another area upriver of Cashman Park on the Newburyport side, though it is wetland and is surrounded by residential abutters who have heavily opposed development of this land in the past.

In the long term, however, a significant expansion of recreational boating will require major basin and channel work by the public along with the private shoreside development. On the Salisbury side the only possible location for such development would be on what is now tidal marshland and, while development is not totally precluded by environmental considerations, it is clear that the environmental problems would be severe and is is recommended that sites in the Salisbury marshes not be considered at this time, even for long term planning purposes.

On the Newburyport side, however, the waterfront area

between the Coast Guard Station and the existing seawall (where the abandoned railroad right-of-way joins the waterfront), is with the exception of the American Yacht Club, either unused or devoted to non-water uses such as the electric power station and the oil storage depot. These non-water users should be encouraged to consider relocating to areas away from the waterfront or, at least, to consolidate their use of the land back from the waterfront to make this valuable waterfront land available for more appropriate use.

Below the yacht club, there is approximately 1000-1500 feet of waterfront that could be developed without encroaching on clamming areas, were a channel and basin to be dredged. It is recommended that this possibility be considered as part of a long term plan and the Corps of Engineers be requested to conduct a study of its technical feasibility and an estimate of the cost. If the construction of a basin and channel here is technically possible and would not unfavorably affect the rest of the harbor and the clam flats, then an entirely new marina complex with nearly 50 acres of water area and ten acres of service land could be created.

This is approximately the correct ratio of land to water area for complete marina complexes. For boats of maximum size 30-35 feet, a marina can usually accomodate 15-20 boats per acre in fixed slips, including allowances for access channels, piers, and floats. If the current is high, as it may be in such a basin, then the berth

density would have to be reduced, so we would estimate that a marina of some 600 boats could be accomodated here. The ten acres of service land would contain about two acres for service and administrative buildings and seven to eight acres of parking which, at 90 cars per acre, will provide better than one space per slip. The parking area could, as is common now in local marinas, be used for dry storage of boats in winter; but the basin should be designed to prevent entrance of ice floes so that it can be used for winter wet storage with bubblers. (At present there is a scarcity of winter wet storage throughout the North Shore and into New Hampshire as well).

Obviously, this very ambitious long term development must be accompanied by substantial improvements in the existing channel and basin and a solution to the problems at the mouth of the river.

X.5 Other Harbor Developments

X.5.1 Short Term

With the completion of the new waterfront park in the summer of 1978, the downtown area and the waterfront will become actively joined to each other for the first time in decades. Each can and will contribute to the other, both economically and aesthetically. The marinas and associated marine businesses between the park and the Route 1 bridge are quite close to the business and shopping district, but there is little pedestrian traffic between them. Though it is possible to walk from one marina to another, the trip can involve muddy passages, weed-grown patches, and piles of floats, boat cradles, and other material. The area is hardly suited to the type of casual pedestrian traffic that could bring the central business district into closer contact with boating activities and vice-versa. A cooperative clean-up effort among these marinas, possibly with City assistance in the form of manpower and equipment, could do much to improve the accessibility and attractiveness of the waterfront to residents and visitors alike. Conversely, cruise visitors who are made to feel like they are visiting a lively harbor and city and not just a marina or berth for the night are more likely to spend more time here and to return again or recommend the area to their friends and acquaintances.

In addition to this clean-up effort, the City should consider some means to assure that this access along the

waterfront, in fact all along the waterfront, will continue. The assurance may take the form of rather informal agreements among all waterfront property owners and marinas to keep fences and other obstructions to the absolute minimum necessary to the operation and security of their business. More formally, the City might acquire public easements across the various parcels so that public access could be assured, though not necessarily by means of a paved or landscaped walkway that would reduce the usable area of the waterfront land.

X.5.2 Long Term

The few floats that will be part of the new bulkhead and waterfront park plan in Newburyport will be adequate for a first year test but in the longer term several other developments should be considered. There are many basically organizational questions that will be discussed elsewhere in this report but in a purely physical sense, the few floats currently planned are going to be inadequate. As currently planned, the floats could accomodate only three or four luxury cruisers, perhaps five or six large boats, or seven to eight smaller boats. There are at present no firm plans for publicly owned guest moorings, and the floats will not have services available. Furthermore, the floats will use less than a third of the waterfront footage of the new bulkhead.

Several development possibilities present themselves. Additional floats could be installed along the entire 900

foot length of the bulkhead and/or a finger pier and dolphins could be installed to permit one or two more rows of floats further out in the river. If this were done and the entire bulkhead frontage given over to pleasure boats, the slip capacity could be perhaps as much as ten times what it will be in the short term.

Regardless of how many slips there are however, their intended use, attraction of transient cruise trade will be thwarted unless the floats are provided with some basic services - at least electricity and possibly potable water as well. Full services such as fuel, ice, bait, and other supplies and services should probably not be offered since this would put the public into the competitive marina business. It would also be advisable to place at least a few guest moorings near the public floats to handle the overflow traffic during high use periods.

Another alternative would be to reserve at least part of the bulkhead frontage as nighttime mooring and display space for the many party boats and charter boats currently operating in the harbor. This could both increase the charter and party boat business and add to the general atmosphere of the harbor for residents and visitors. If this is done however, the space should be for display purposes only and there should be no land access to the boats at that location. It would be both impermissible under the funding contracts for the waterfront park and inconsistent with the intended use of that part of the waterfront. If this use of the bulkhead frontage is accepted, it would be desirable to make the display spaces equally available to

all charter boats and party boats operating in the harbor, whether their operation is centered in Newburyport proper Plum Island, or Salisbury, in recognition of the fact that the entire harbor should be developed as a unified whole and not just that part closest to the Newburyport central business district. It is also recommended that each boat owner who wishes to use this display area should be responsible for installing his own mooring system so that no additional public expense is involved.

Finally, whatever organizational structure is eventually selected for management and operation of the bulkhead and floats, it is clear that they must be adequately policed and maintained and, in particular, to assure that they are reserved for non-residents. There is clearly a great and growing potential for cruise trade in this area and an essential factor in attracting it will be adequate, convenient, and physically attractive guest facilities.

X.6 Organizational Developments

A complete presentation of our full recommendations for the administration of the harbor in conjunction with other City functions is presented later on in Chapter XI of this report. Regardless of whether those recommendations are implemented, however, we feel it is essential for both communities, and other small harbor communities as well, to re-examine the role of the local harbormaster.

In both the communities under study and in most communities of the Commonwealth, the position of harbormaster is a part time position with only a token salary paid by the city or town. Though the individuals holding such positions, and their usually volunteer assistants, are frequently quite dedicated and work hours that are totally inconsistent with the token salary, the fact remains that in most small harbors the harbormaster must realistically look on his position and duties as little more than a hobby. One can only assume that this situation has arisen historically because the harbormaster had only limited duties such as the pro-forma issuance of mooring and slip permits. With the rapid increase in boating, however, and the proliferation of expensive boating equipment, the duties of small harbor harbormasters have expanded considerably, particularly their police functions. Pilferage of removable boat equipment, especially from moored boats, has become a serious problem that is difficult to solve with a single part time harbor patrol officer and one or two volunteer assistants.

Another area where harbormaster duties have expanded is in the operation of publicly owned waterfront facilities such as the boat-ramp in Cashman Park and, presumably the guest slips at the new bulkhead. A publicly owned fish pier of the type being recommended will of course expand harbormaster duties even further. In order to cope with these vastly expanded duties and responsibilities the communities should give consideration to either a full-time paid harbormaster position or at least a part-time position with a salary more nearly consistent with the duties and time requirements.

Funding of these increased expenses can be handled in several ways. It could be done with just a larger appropriation of general funds as is done now or it could be handled with harbor derived revenues through a separate fund that could also cover minor expenditures on equipment for the harbormaster or the publicly owned facilities. Current sources of revenue in the study area are limited solely to fees for use of the public boat ramp but, at least in the case of Newburyport, future sources of revenue will be the floats at the new bulkhead and lease payments on the ice facility and these could and should be held in a special fund to cover harbor expenses, most notably the harbormaster salary.

CHAPTER XI: SMALL HARBOR ADMINISTRATION

XI. 1 Background

Both of the communities in the study area, in common with most coastal communities of the Commonwealth, have very limited harbor related administrative structures. Both have part-time harbormasters and shellfish wardens whose main duties, both by statute and by custom, are limited to police functions, security of waterfront property, and minor control over moorings and waterfront structures. In the case of Newburyport, the harbormaster duties have also been expanded to include management and operation of the public boat ramp at Cashman Park, but this is an atypical function of a small harbor harbormaster.

In any event, harbormasters in general have no responsibility for harbor development planning nor the power to impose a harbor master plan or even any existing or future zoning regulations. The existing powers and duties of harbormasters are quite limited and in many cases easily superseded by other persons or agencies at local, state, or Federal levels. All of the foregoing was quite evident at the outset of this study, but the grant of funds by the New England Regional Commission for an ice facility in Newburyport served to underscore just how limited the administrative structures of small harbors are and how that administrative weakness could serve to impede or even thwart otherwise sound development plans. It has always been accepted that small harbor development can only proceed after an appropriate plan has been developed and after funds have been obtained. It is further and equally clear, however, that the development plan must also include an adequate institutional structure to

administer both the development of the harbor and its subsequent operation.

The initial reason for examining the question was, as we have said, the impending construction of a publicly-owned ice facility for commercial fishermen. There are, however, other factors to encourage consideration of a new harbor administrative structure in Newburyport and, in similar or related ways, they may apply to coastal communities as well. Considering each in turn, they are:

a) The Ice Plant

There is at present no City agency whose duties or authorities are strictly related to the receipt of the NERCOM grant; the solicitation of further funds sufficient to obtain an ice plant; purchase and construction of the facility; establishment of fees for the sale of ice; or the actual operation of the facility. In the absence of such an agency, all of these matters must be handled on an *ad hoc* basis either through the Office of the Mayor, the Harbormaster, or the Department of Public Works.

b) Existing Public Boat Ramp

A similar situation has existed with the public boat ramp. It is operated under an ad hoc arrangement by the Harbormaster acting, in essence, as an agent of the City Council. The Council sets rates and rules of operation and the Harbormaster simply acts accordingly. Revenues from the facility go into the General Fund and expenditures come from the General Fund independently but with the approval of the Council. No connection is maintained between

sales income and operational expenses. This is true of both routine expenses, e.g. seasonal and annual maintenance, and extraordinary matters such as capital investments, however minor they might be. Among other things, it is possible that the connection between the revenues generated by the facility and its needed expenditures could become so tenuous as to cause the Council or the public at large to mistakenly conclude that the facility had become a drain on public funds while it could, in fact, be operating in the black.

c) New Bulkhead and Floats

At present, the new waterfront park and associated facilities is under the title of the Newburyport Redevelopment Authority but the NRA will, upon its completion, turn the entire facility over to the City. There is no agency whose charter clearly suits it to such a function so it is probable that another *ad hoc* arrangement will be needed with the Harbormaster, the Public Works Department, or possibly the Parks Department. Whatever happens, the new "owner" will have to make *ad hoc* provisions for policing the use of the facility, maintaining it, establishing and enforcing use regulations, and operating it. It is not yet clear if there will be, could be, or should be fees associated with the new floats but, if so, the same problems with revenues and appropriations for the boat ramp could occur here as well.

d) Other Public Facilities

The longer term plans discussed in Chapter X envision some rather ambitious waterfront development

projects for the study area and it is clear that they are beyond local funding capabilities. Federal or State assistance, or both, will be required and at present there is no properly constituted body whose charter deals with either the pursuit of such funds or the preparation of the necessary detailed plans and proposals. The Office of Mayor could and probably would assume such a function along with the Redevelopment Authority, but again we are talking of ad hoc arrangements. Should such facilities be funded and built, then of course the problems with the existing boat ramp and the nearly complete waterfront park would arise all over again.

e) Implementation of the Harbor Development Plan

A harbor development plan, in the target communities or any other small communities, is a unique undertaking and has no local planning counterpart with the possible exception of an urban renewal or redevelopment plan. Clearly, however, it is beyond the purview of routine Planning Board or zoning activities, and it requires something akin to a redevelopment authority but with the entire harbor as its "redevelopment area."

Based on all of the above points, it became clear that some sort of new governmental or quasi-governmental entity was or would soon be required in the study area as well as in other small harbor communities wishing to pursue development of their harbors. The possible form, powers, and duties of such an entity will be discussed in subsequent sections of this chapter.

XI. 2 Possible Structures and Powers

Few, if any, models exist that could be readily applied to the Newburyport situation so we have conceived of several alternative possibilities from which this or any community could choose to achieve its desired objectives.

The objectives or purpose of a harbor development agency could be to:

a) provide an effective means of managing the activities and uses of the harbor area;

b) seek the highest and best use of the natural and manmade resources of the harbor area;

c) protect the natural environment of the harbor;

d) promote and enhance both recreational boating and commercial fishing industry uses of the harbor; and

e) coordinate development activities of various federal, state and local agencies whose actions affect the harbor area.

There are two primary considerations in selecting the most appropriate entity to guide the development of the harbor area and to achieve the above objectives. The first is the structure or organizational framework that would house the functions of harbor planning and development, and the second is the powers that are essential to achieve the desired objectives.

There are several ways of addressing the appropriate mix of structure and powers, and these ways are interrelated in that certain structures tend to imply a set of powers or vice versa. Within any choice of structure or

powers, there are a variety of options available to a community in order to create the desired harbor development entity. These options vary from creating new agencies to expanding the responsibility of existing ones, but one of the most important distinctions among the various options is the question of where and with whom discretionary powers should lie.

Table XI. 1 lists in an outline format four basic levels of harbor development entities with their respective powers. This can be used as a first step to consider the nature of the harbor development entity desired. Once the nature of the entity has been determined, other considerations come into play to implement the chosen harbor development entity.

Table XI. 1

HARBOR DEVELOPMENT ENTITIES
LEVELS, STRUCTURE & POWERS

LEVEL I: Harbor Development

Structure	Powers
Multi-member committee or line department. Committee composed of various key boards such as chief executive, redevelopment, planning, conservation, harbor master, local user interests, etc.	Created by administrative order, primarily a coordinating body or office. Has no powers other than those existing within the Mayor/Selectmen's office or other relevant boards or agencies. May have staff assigned such as harbor master, town planner, etc. Relies on voluntary interaction, may have advisory board.

LEVEL II: Harbor Development Commission or Commissioner

Structure	Powers
Multi-member commission or single-member commissioner with line responsibility to chief executive. Commission composed of various individuals outside of existing county agencies or as outlined above.	Created by municipal ordinance/bylaw. Can be assigned powers and responsibilities and oversight on actions of other relevant boards as a prerequisite to legislative approval of other boards' actions. Can be assigned jurisdictional area and authority over public holdings and actions in harbor area, e.g. town pier, moorings, etc. Can set fees or advise on fees for harbor services. Promotes interaction and coordination among various relevant agencies concerned with harbor development. Can adopt powers of an EDIC/IDFA with special mandate on harbor development.

LEVEL III: Harbor Development Authority

Structure	Powers
Multi-member board or single-member authority modeled after the community development department structures as discussed in OLA publication No. 1 and functioning within the local governmental structure.	Created by special act of the legislature modeled after Chapter 121 B (with local by-law regulation). Has all powers called for in Level II and assigned specific area of jurisdiction and power, including financial as presently exists for a redevelopment authority with modifications as deemed appropriate.

LEVEL IV: Harbor Development Corporation

Structure	Powers
Multi-member quasi-public corporation functioning outside of the local governmental structure.	Created by special act of the legislature modeled after Chapter 121 C. Basically functions as a development agency but with the broad powers of an EDIC modified to include commercial enterprises as well as industrial.

From the foregoing, a clearer understanding of the nature of the desired harbor development entity can be realized and a preferred preliminary structure/power relationship can be selected. Because of the limited range of existing harbor development legislation, however, new or modified special legislation may be necessary if a Level III or IV harbor development agency is desired. For illustrative purposes, let us assume that a Level III agency is desired with the maximum powers that exist and can be delegated to local governments.

First of all, the precise structure should be determined. This step is important since it determines where the discretionary powers will be, and who would have these powers, and to whom they would be accountable. Basically, there are two choices:

a) An Independent Board (Authority) appointed by the mayor and/or city council in the case of a city or appointed by the selectmen/moderator or elected by ballot in the case of a town. There are various combinations and permutations of these methods of appointment/election in each case, but the general point is the creation of an independent municipal authority within local government that retains virtually all of the discretionary power over harbor development with only limited oversight by the chief executive and legislative bodies of the municipality.

b) A line agency under the direct control of the chief executive. The agency could consist of either a "commission" or a single-member authority. The single-member concept is simply a convenient tool to vest certain powers in an agency under the control of a single professional person who in turn is directly

accountable for his actions and decisions to the chief executive and legislative body. This method focuses responsibility on one individual who is directly accountable to elected officials. The intent is to create an entity that is accountable within the generally elected municipal government structure.

Either of the above choices is acceptable and each has its precedents. In the case of the former, housing or redevelopment authorities serve as convenient examples. In the latter case, examples would include water, sewer, or public works commissioners; state agency commissioners, and, in a few instances, community development authority directors. The ultimate choice is a political one that should be based on such factors as the political tradition in a municipality, the degree of political sophistication, the strength or form of local government, and the degree of commitment and demand for action on the part of the local political leadership.

Once the fundamental structure is determined, the exact nature of the powers necessary to achieve the purpose of the harbor authority must be worked out. The following is a list of some of the powers that a Level III harbor authority should have to assure the implementation of its plans/programs and objectives:

a) Control or some form of jurisdiction over a specified area of land and water necessary to and consistent with the proper development of the entire harbor area.

b) Specific authority over activities in the area of jurisdiction including placement of moorings, type

and size of moorings, dredging areas, channels, piers, floats, launching ramps, boat liveries, and land use including parking areas, marinas, gas facilities, ice facilities, etc.

c) Authority to construct facilities for the efficient use of the harbor including piers, warehouses, launch ramps, mooring systems, and related installations.

d) The ability to buy and sell land for any purpose consistent with or necessary to proper harbor usage and development. Limits may be placed and detailed definitions of what is deemed appropriate may be set, but generally any public, commercial or industrial use that focuses activity and promotes development and use of the harbor would be acceptable.

e) The authority to promulgate regulations governing the use of facilities under its control including fees for moorings, rental of slips, or other use fees. Such fees may be established by the local legislative body, approved by it, or otherwise checked to assure that charges are reasonable and appropriate.

f) Law enforcement powers in order to regulate and police harbor usage. Included here would be powers of the harbor master, the harbor patrol, or the registry of marine vehicles. The entity would also have the power to levy fines or penalty fees as established by the local legislative body.

g) Receipt of funds such as federal or state grants, gifts and donations, grants from private foundations, municipal appropriations, and so forth; and the power to expend such funds as necessary to its operation.

h) Preparation and execution of plans for the development of the harbor including all land areas and functional activities within the harbor authority jurisdiction.

i) To have the powers of or be capable of functioning as an Economic Development and Industrial Corporation (EDIC), Industrial Development and Finance Authority (IDFA), and a Limited Dividend Corporation (121A) under the laws of the Commonwealth. Such powers to be primarily concerned with raising funds through the issuance of debt, subject to the control of the municipality.

j) To sue and be sued as is customary with public agencies subject to the laws of the Commonwealth governing the accountability and authority of public agencies.

The above powers as listed are not complete nor definitive, but they provide a list of the types of powers a harbor authority ought to have to achieve its objectives. The limitations or checks against the power of the authority could be controlled in various ways.

First of all, the chief executive would exercise direct control over the exercise of these powers. Secondly, no power can be exercised by the authority if it supersedes the powers of other municipal agencies such as the planning board, conservation commission, and the like. More explicitly, the powers of an EDIC, IDFA, and 121A corporation would be controlled by the state as would other activities subject to the review and approval of state agencies.

XI. 3 Community and Harbor Development Authority

While the preceding section dealt in rather general terms with the possible structures and powers of a harbor development entity, the nature of the study area, especially Newburyport, is such that the development of the harbor and the development of the community at large are so closely intertwined as to be nearly synonymous. Because of this close linkage, the study team feels that the specific organizational plan that would best suit Newburyport would place the harbor development function under the same roof, as it were, with the more generalized community development activities.

Accordingly, it is suggested that the City move to create a Community and Harbor Development Authority with the powers necessary to accomplish its objectives. This can be achieved by consolidating several of the existing agencies in the City with broad powers in the area of harbor and community development under a new community and harbor development mandate. Under certain options, it may not require special legislation and, in fact, it may be largely accomplished by City ordinance or charter revision.

The following organization chart depicts the overall framework of the suggested community and harbor development authority for the City. Essentially, it consists of consolidating the line functions of the harbor master, shellfish warden, harbor facilities maintenance, planning (and zoning), urban renewal and the inspection functions of building, wire, plumbing, gas etc. These line agency functions would be under the control of the Community and Harbor Development Coordinator (or Director) who would be directly accountable to a Community and Harbor Development

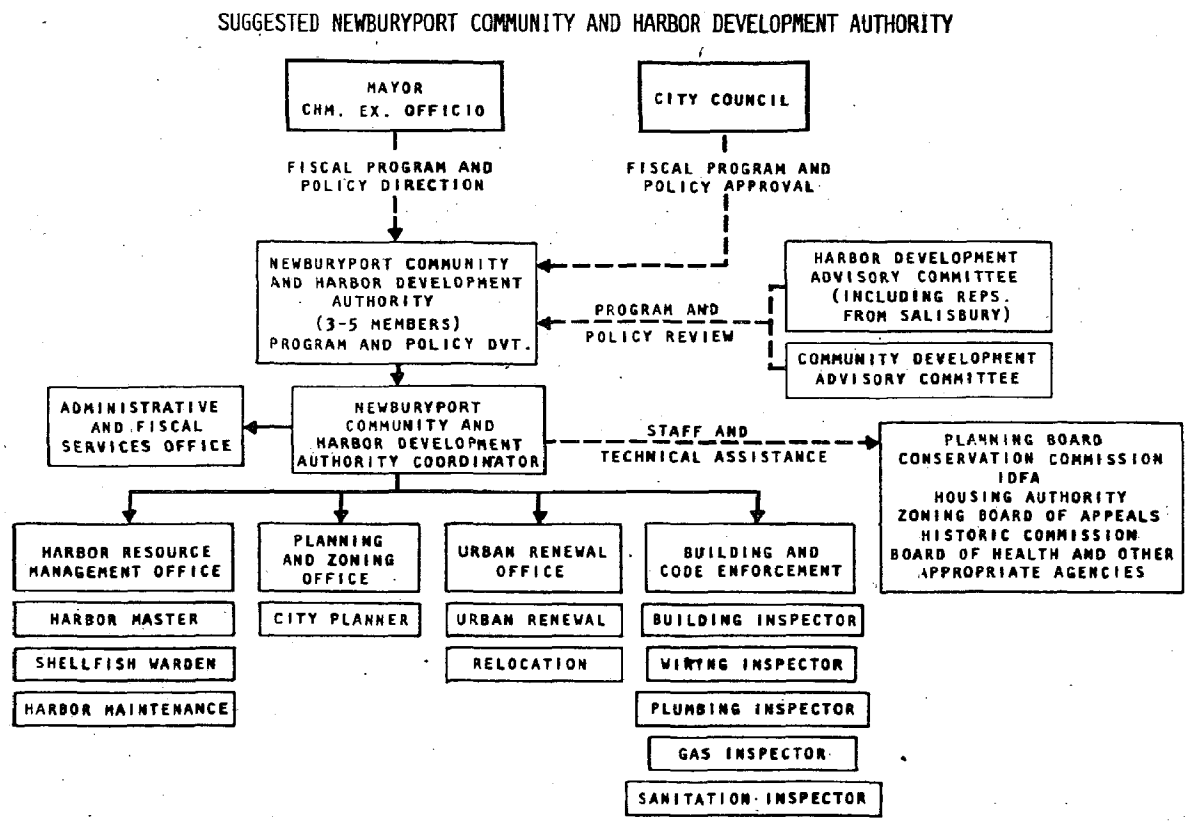


FIGURE XI.3.1 ORGANIZATION CHART OF SUGGESTED NEWBURYPORT COMMUNITY AND HARBOR DEVELOPMENT AUTHORITY

Authority. The Authority would receive fiscal, program and policy direction from the Mayor with approval by the City Council. The Authority would also be subject to program and policy review by harbor development and community development advisory committees.

The functional position of each component of City government under the proposed new arrangement would be as follows:

a) The Mayor

The Mayor, as chief executive, has the overall responsibility of guiding the development of the City. He has the authority over various town agencies, especially the line departments proposed to be transferred to the Community and Harbor Development Authority. The Mayor could be made a part of the Community and Harbor Development Authority as chairman ex-officio or he could remain separate from the Authority. In the former case, special legislation may be required and this will be discussed later along with the question of the creation of the Community and Harbor Development Authority. Under either option, however, the Mayor would provide varying degrees of fiscal, program and policy direction over the affairs of the Community and Harbor Development Authority.

b) The City Council

As the legislative body of the City, the Council would have the responsibility for approving expenditures and raising funds for the operation of the Community and Harbor Development Authority. It also would have significant policy and program control

both through the "purse strings" and under various relevant statutes such as 121B (urban renewal). The Council could also exercise even greater control over the Community and Harbor Development Authority's activities, if necessary, through its ordinance powers.

c) Community and Harbor Development Authority

As the title implies, this authority would be the agency responsible for developing and executing community and harbor development plans, programs, and policies. The authority can be composed of 3 to 5 members, but because of the heavy work load, a large group is recommended to provide an opportunity for 3-member subcommittees. The authority would derive most of its discretionary powers from Chapter 121B, the urban renewal enabling legislation, and could be formed in one of several ways:

1. Abolish and reconstitute the existing Newburyport Redevelopment Authority (NRA) through special act and at the same time make provisions for the Mayor as chairman ex-officio;

2. The NRA voluntarily votes to dissolve itself in accordance with the provisions of 121B and the City substitutes a new authority (Community and Harbor Development Authority) as prescribed by 121B; or

3. Re-title the NRA, keeping the existing membership for transitional purposes and phasing in new members to achieve the appropriate mix of harbor and urban renewal representation. This could be accomplished by ordinance or

charter revision, as appropriate, with the voluntary acceptance of the NRA. This option could be the most easily accomplished and would assure continuity and smooth transition from current NRA projects to new activities.

d) Harbor Development Advisory Committee

This committee would be composed of 10 to 15 citizens having a direct concern with the development of the harbor such as commercial and sport fishing operators, recreational boaters, and representatives of the Town of Salisbury. Their function would be to review the Community and Harbor Development Authority's policies and programs as they relate to their special interests and to hold whatever power over the Authority's decisions that the City chooses to grant.

e) Community Development Advisory Committee

This committee would also be composed of 10 to 15 citizens, but having a direct interest in community development in general, especially downtown renewal. Its mandate would be similar to the Harbor Development Committee but with concern over its particular interests, and it would provide input to the Community and Harbor Development Authority accordingly.

f) Community and Harbor Development Authority Coordinator

The Community and Harbor Development Authority Coordinator would be charged with executing the plans, programs and policies of the Authority. He would be the chief executive officer of the Authority, and as such he would have control over the various line

offices in his jurisdiction. As an appointee of the Community and Harbor Development Authority (subject to whatever confirmation desired), he should be a skilled professional administrator in the area of planning and development, and it is recommended that he work under a long-term contractual arrangement (3 years) with the Authority. His position would be exempt from civil service provisions, and he would be responsible for the recruitment and hiring of subordinate staff. His authorized staff would handle all of the fiscal and administrative services needed by the Authority in its own operations, and various City agencies whose interests are closely related to harbor and community development would also receive staff and technical assistance through the Coordinator's office. These agencies would include the Planning Board, Conservation Commission, Housing Authority, IDFA, Zoning Board of Appeals, Historic Commission, Board of Health, and others as appropriate or necessary.

The Community and Harbor Development Authority office would provide an opportunity for coordinating the issuance of development permits through its line agency control and staff/technical assistance relationship as outlined above.

g) Harbor Resource Management Office

This office would be the prime line agency responsible for managing the harbor facilities, services and resources that are primarily water related. These facilities would include moorings, regulation of private marinas, public piers and wharfs, storage

facilities, launching ramps and the like. The harbor master, shellfish warden and a maintanance person(s) would be housed within this office. Most importantly, the proposed ice facility would be under the jurisdiction of this office, and operation and maintenance would be handled by staff assigned accordingly or through special lease arrangements with a fishing cooperative or other local operation such as a marina. The same would be true of any future publicly owned developments in the harbor; such as a public commercial fishing pier.

h) Planning and Zoning Office

The planning and zoning office would house the city planner. It is recommended that the city planner also be appointed as the zoning administrator for the City in accordance with the provisions of Section 13 of Chapter 40A as amended. His functions would include general municipal planning, staff services to the city planning board, planning assistance to other Community and Harbor Development Authority line agencies, zoning board of appeals, and other planning-related services and functions as necessary.

i) Urban Renewal Office

The existing urban renewal staff would be transferred to the Community and Harbor Development Authority and would continue to administer current projects. This office would also function as the implementing agency for new urban renewal projects throughout the City and especially projects related to harbor development. As an urban renewal office,

its operation would be similar to its current operation, except that the Community and Harbor Development Authority Coordinator would exercise control over its operation. Existing and future Community Development Block Grant funds would also be administered partly through this office.

j) Building and Code Enforcement Office

Consolidation of the building inspection functions into one line office would provide direct coordination among related inspection activities and an opportunity to administer a concentrated code enforcement program. The building inspector would function as the zoning enforcement agent prescribed by Chapter 40A as amended. The function of wiring, gas and plumbing inspection would also be housed in this office. Also, it would be desirable to include the sanitation inspector or housing inspector within this office, but generally, not those functions which are considered to be under the authority of the City Board of Health, such as restaurant and nursing home inspection. The exact nature of the division of responsibility between housing and community development, health regulation, and general public health regulation would need definition and further clarification.

CHAPTER XII. REGULATION OF MASSACHUSETTS' HARBORS HARBORS

XII. 1 General

Authority over Massachusetts' harbors rests at all three levels of government; federal, state and local. Traditionally, the United States Coast Guard and the U.S. Army Corps of Engineers have been the primary agencies at the federal level which have held authority over harbor waters, the Coast Guard having as its primary concern navigational safety while the Corps of Engineers focused on structural alterations and dredging in harbor areas. This is not meant to imply that these agencies and others discussed are restricted to harbor areas but only, for the purposes of this study, to indicate their relationship to harbor waters and associated activity. The National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce through the Coastal Zone Management Act of 1972 has been mandated a key role in establishing guidelines for the future of the United States' coastal areas and thus is the third federal body with authority that can have an impact upon Massachusetts' harbors. Since the development of Coastal Zone Management plans has been delegated to the states, further description of the Coastal Zone Management Program will be undertaken with the appropriate state agency later in this chapter.

The Commonwealth of Massachusetts maintains authority over its harbors through several agencies, though they are consolidated within three secretariats: Executive Office of Environmental Affairs, Executive Office of Human Affairs (Department of Public Health), and the Executive Office of Public Safety. Their responsibility extends to such areas as health, safety, access, marine vehicle registration, navigational and structural regulation, construction and maintenance, and pollution abatement.

The Executive Office of Environmental Affairs maintains the overwhelming responsibility for harbor waters and related activi-

ties through the Department of Environmental Engineering; the Department of Fisheries, Wildlife and Recreational Vehicles, and the Office of Coastal Zone Management. The remainder of state involvement in these marine and harbor areas rests with the Department of Public Health and the Department of Public Safety of the Executive Offices noted above.

Massachusetts municipalities also have the responsibility and the authority to control and regulate marine activities within their harbors and coastal waters. The principal agent at the local level for regulating and overseeing marine activity is normally the harbormaster; however, other authority over coastal waters within local jurisdiction can be vested in shellfish wardens and harbor patrol officers and the municipal police department. Local ordinances and by-laws may also be used to broaden local control over coastal activity in areas not in conflict with either state or Federal authority. The Conservation Commission, a local appointive body, possess authority over actions affecting wetlands, including tidal marshes and flats. Figure XII.1 indicates the governmental agency responsibility over harbor areas at all three levels of government.

XII.2 State Agencies

2.1 Executive Office of Environmental Affairs

2.1.1 Department of Fisheries, Wildlife and Recreational Vehicles

The Department of Fisheries, Wildlife and Recreational Vehicles of the Executive Office of Environmental Affairs has within it the Division of Marine Fisheries, the Division of Marine and Recreational Vehicles, and the Public Access Board, each of which possess authority over certain aspects of Massachusetts harbors.

a. Division of Marine Fisheries

The Division of Marine Fisheries is responsible for administering Chapter 130 of the Massachu-

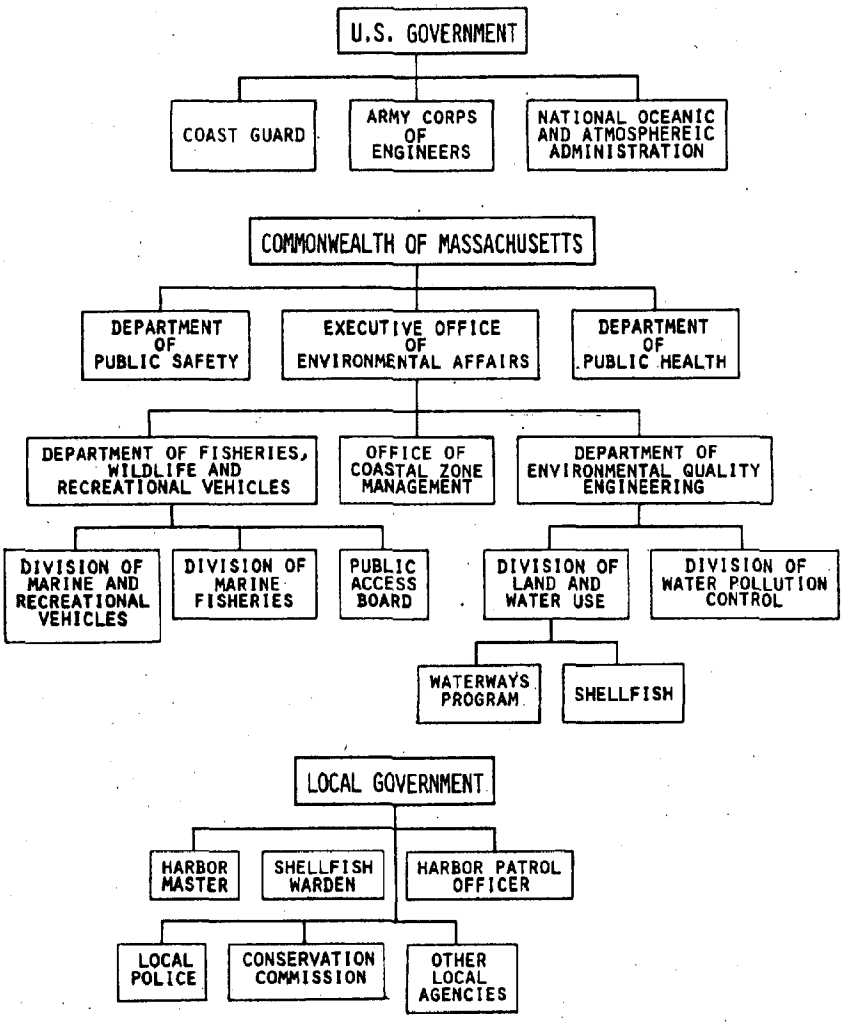


FIGURE XII.1 GOVERNMENT AGENCIES WITH REGULATORY AUTHORITY OVER HARBOR AREAS

setts General Laws. Its authority extends to the regulation, permitting and licensing of fishery activity and the review of certain local activity authorized by Chapter 130. The Director of the Division of Marine Fisheries is authorized to aid in the promotion and development of the commercial fishing industry; investigate improved methods of marketing and distributing commercial fish products; and to establish standards and design labels for the identification of commercial fish products processed, prepared or packed for distribution and for retail sales.

The Division has responsibility for the adoption, amendment and repeal of rules and regulations regarding (1) manner of taking fish, (2) legal size limits, (3) seasons and hours during which fish must be taken, (4) numbers and quantities of fish which may be taken, (5) the opening and closing of areas within coastal waters to the taking of any and all types of fish.[2]

The Director:

(1) may take actions that provide for the passage of salt water fish into fresh water to spawn.[3]

(2) shall assist and cooperate with coastal cities and towns for the purpose of increasing the supply of shellfish.[4]

(3) shall devise a system of statistical information useful to the marine fish industries of the Commonwealth and shall compile information obtained within it.[5]

(4) shall receive annually the number of pounds and the value of each kind of edible fish caught from owners of boats and fishing gear.[6]

---

1. M.G.L. C. 130, S. 17
2. M.G.L. C. 130, S. 17A
3. M.G.L. C. 130, S. 19
4. M.G.L. C. 130, S. 20
5. M.G.L. C. 130, S. 21
6. M.G.L. C. 130, S. 33

(5) is responsible for issuing a permit for fishing or the taking of lobsters and edible crabs in coastal waters.[7]

(6) shall not issue more than 1300 commercial fishermen permits for the taking of lobsters in coastal waters annually.[8]

(7) may grant or revoke written permits for the digging or taking of shellfish from an area determined to be contaminated.[9]

(8) shall promulgate rules and regulations relative to all permits issued under Chapter 130.[10]

Police officers of cities and towns bordering on coastal waters which have accepted the provisions of Chapter 130, S. 8A, shall have certain authority granted to natural resources officers. These same cities and towns which border coastal waters may authorize any person to construct weirs, pound nets or fish traps but not without the approval of the Director of Marine Fisheries.[11] Cities and towns shall appoint shellfish constables who shall initiate, promote and manage shellfish in the city or town and enforce all statutes, ordinances, by-laws, rules and regulations relative to shellfish in such city or town.[12] These communities may control, regulate or prohibit the taking of eels and any or all kinds of shellfish and seaworms within their geographical jurisdiction and may make regulations not contrary to law.[13]

The Commissioner of the Department of Fisheries, Wildlife, and Recreational Vehicles may construct and operate shellfish purification plants for the treatment of shellfish taken from areas determined to be contaminated,[14] while the Director

7. M.G.L. C. 130, S. 38
8. M.G.L. C. 130, S. 38B
9. M.G.L. C. 130, S. 75
10. M.G.L. C. 130, S. 80
11. M.G.L. C. 130, S. 29
12. M.G.L. C. 130, S. 98
13. M.G.L. C. 130, S. 52
14. M.G.L. C. 130, S. 76

is authorized and directed to study methods for treatement or purification of shellfish taken from such areas.[15]

Section 80 of Chapter 130, M.G.L., requires permits for the taking of fish for commercial purposes; a person shall not for commercial purposes acquire, handle, store, distribute, process, fillet, or ship or sell raw fish in bulk or for resale without first obtaining a wholesale dealer permit. A person shall not sell raw fish at retail without a retail dealer permit.[16]

b. Division of Marine and Recreational Vehicles

The Division of Marine and Recreational Vehicles receives authority from Chapter 90B of the Massachusetts General Laws. Its authority with respect to harbor and coastal waters includes regulatory jurisdiction over motorboats. The Director of the Division of Marine and Recreational Vehicles is authorized to make rules and regulations not contrary to laws of the Commonwealth or the United States[17] and to administer and enforce the provisions of Chapter 90B.[18] However, enforcement of the law may be extended to authorized agents of the Director, harbor masters and assistant harbor masters, harbor patrol officers, enforcement officers of the Department of Natural Resources, fish and game wardens, state police, and by town and MDC police assigned to patrol waters of the Commonwealth.[19]

Cities and towns may regulate motorboat activity if not contrary to Chapter 90B or its rules and regulations,[20] though the Director of the

15. M.G.L. C. 130, S. 20
16. M.G.L. C. 130, S. 80
17. M.G.L. C. 90B, S. 11
18. M.G.L. C. 90B, S. 11
19. M.G.L. C. 90B, S. 12
20. M.G.L. C. 90B, S. 15

Division of Marine and Recreational Vehicles may approve or disapprove any ordinance or bylaw of any city or town which regulates the operation of such vessels.[21]

All motorboats of five horsepower or more operating on the waters of the Commonwealth must be registered.[22] Monies received by the Commonwealth from fees shall be credited to the Recreational Boating Fund for payments of the administration and enforcement expenses of the Division; conducting programs of boating safety education; construction of access to water areas, including land parking areas, roads, launching ramps and docks; and for reimbursement to cities and towns for undertaking the above-mentioned projects.[23]

c. Public Access Board

The Public Access Board is yet another agency of the Department of Fisheries, Wildlife and Recreational Vehicles. The composition of the Board, however, reaches outside the Department and consists of the Directors of the Division of Fisheries and Wildlife; Division of Marine and Recreational Vehicles; Division of Marine Fisheries; Division of Forests and Parks; and the Deputy Chief Engineer of the Division of Waterways. Section 17A of Chapter 21 of the Massachusetts General Laws allows the Public Access Board to designate locations of public access to great ponds

21. M.G.L. C. 90B, S. 11
22. M.G.L. C. 90B, S. 2
23. M.G.L. C. 90B, S. 16

and other waters of the Commonwealth. The Department of Fisheries, Wildlife and Recreational Vehicles may construct such roads, parking areas, docks, ramps, trails, shelters, comfort stations, and related facilities as may be designated.[24]

2.1.2 Department of Environmental Quality Engineering

The Department of Environmental Quality Engineering has within its jurisdiction two agencies with responsibility for and authority over coastal waters and harbor areas. They are the Division of Water Pollution Control and the Division of Land and Water Use. The Division of Land and Water Use was recently created by an administrative act and includes among other powers and authority the Division of Waterways. The Department of Environmental Quality Engineering for the purposes of this discussion has jurisdiction over water pollution prevention, control and abatement; waterways management with respect to navigation, commerce and related activities; and the testing of shellfish for pollution and contamination.

a. Division of Land and Water Use

The Division of Land and Water Use, through its waterways authority, is responsible for administering Chapter 91 of the Massachusetts General Laws. The Division, through delegated authority of the Department of Environmental Quality Engineering, has the following authority and responsibilities:

(1) The charge of the lands, rights in lands, flats, shores and rights in tidewaters belonging to the Commonwealth.[25]

(2) The right to take by eminent domain or acquire by purchase or otherwise, and hold such real

24. M.G.L. C. 21, S. 17A

25. M.G.L. C. 91, S. 5

property and such rights and easements therein for the purpose of constructing or utilizing of piers and in connection therewith, highways, waterways, railroad connections, storage yards and sites for warehouses and industrial establishments, and may lay out and build thereon... such piers, with buildings and appurtenances, docks, highways, waterways, railroad connections, storage yards and public warehouses as is deemed desirable.[26]

(3) The right to adopt a program of construction of piers and other waterfront terminal facilities at any port of the Commonwealth.[27]

(4) The general care and supervision of the harbors and tidewaters within the Commonwealth, of the flats and lands flowed thereby in order to prevent and remove unauthorized encroachments and causes of every kind which may interfere with the navigation of such harbors, injure their channels or cause a reduction of their tidewaters.[28]

(5) The undertaking of such construction and work for the improvement, development, maintenance and protection of tidal and non-tidal rivers and streams, great ponds, harbors, tidewaters, foreshores, and shores along a beach.[29]

(6) The right to license and prescribe terms for construction or extension of a wharf, pier, dam, seawall, road, bridge, or other structure or for the filling of land or flats, or the driving of piles in or over tide water.[30]

(7) The right to prescribe lines in any harbor of the Commonwealth.[31]

(8) The removal or right to have removed any wharf or pier located in the tidewaters or tide lands of the Commonwealth, which in the opinion of the Department is dilapidated, unsafe, a menace to navigation...[32]

---

26. M.G.L. C. 91, S. 5
27. M.G.L. C. 91, S. 9A
28. M.G.L. C. 91, S. 10
29. M.G.L. C. 91, S. 11
30. M.G.L. C. 91, S. 14
31. M.G.L. C. 91, S. 34
32. M.G.L. C. 91, S. 49B

(9) The supervision of the transportation and dumping of all material dredged in the tide waters of the Commonwealth, or any other material which may be placed in scows or boats to be transported and dumped in the tide water.[33]

The harbormaster of a city or town or whosoever is so empowered by a city or town may authorize by permit the mooring on a temporary basis of floats or rafts held by anchors or, bottom moorings... upon such terms, conditions and restrictions as he shall deem necessary. Any person aggrieved by a refusal to permit such temporary mooring may appeal to the Division, though any actions by a harbor master or the Division are subject to applicable laws administered by the Division of Motorboats (the Division of Marine and Recreational Vehicles), the Division of Marine Fisheries, the U.S. Coast Guard, and the U.S. Corps of Engineers.[34]

Chapter 91 provides for a Harbors and Inland Waters Maintenance Fund the monies of which shall be appropriated for the purpose of continuous maintenance, dredging and cleaning of the harbors by the Division in order to protect the wetlands of the Commonwealth.[35]

b. Division of Water Pollution Control

Sections twenty-six to fifty-three of Chapter Twenty-one of the Massachusetts General Laws are known as the Massachusetts Clean Waters Act. The provisions of this act are the primary responsibility of the Division of Water Pollution Control of the Department of Environmental Quality Engineering.

---

33. M.G.L. C. 91, S. 52
34. M.G.L. C. 91, S. 10A
35. M.G.L. C. 91, S. 35

The Division is mandated the duty and responsibility of enhancing the quality and value of water resources and establishing a program for prevention, control, and abatement of water pollution.[36] Among the powers and duties of the Division are the adoption of regulations requiring proper operation and maintenance of waste treatment facilities;[37] conducting a continuing planning process which will result in plans for reducing, controlling and eliminating discharges to all waters of the Commonwealth;[38] adopting, amending or repealing rules and regulations which it deems necessary for the proper administration of the laws relative to water pollution control and to the protection of the quality and value of water resources, including regulations to control or prevent the discharge of sewage, garbage or other waste material from watercraft of any type, including houseboats;[39] undertaking immediately, whenever there is spillage, seepage or other discharge of oil into any of the waters of the Commonwealth or into any off-shore waters which may result in damage to the waters, shores or natural resources utilized or enjoyed by the citizens of the Commonwealth to cause said spillage, seepage or discharge to be contained and removed by whatever method it considers best.[40]

The Director of the Division is authorized to order municipalities and other governmental units to construct the necessary facilities in order to prevent or reduce discharges to the waters of the Commonwealth.[41] A permit is required from the

36. M.G.L. C. 21, S. 27
37. M.G.L. C. 21, S. 27
38. M.G.L. C. 21, S. 27
39. M.G.L. C. 21, S. 27
40. M.G.L. C. 21, S. 27
41. M.G.L. C. 21, S. 33D

Director for the discharge of pollutants into waters of the Commonwealth or the construction, installation, modification, operation, or maintenance of an outlet for such discharge or any treatment works.[42]

No one shall engage in the business of collecting waste oil or shall dispose of waste oil in any waters of the Commonwealth, without a permit from the Division.[43] Every automobile service station and marina serving powered watercraft shall install on the premises, and maintain, waste oil retention facilities, properly sheltered and protected to prevent spillage, seepage or discharge of the waste oil into storm or sanitary sewers or into the waters of the Commonwealth.[44]

Finally, all marinas are required to be licensed by the Division of Water Pollution Control and without such license they shall not be allowed to operate.[45]

2.1.3 Office of Coastal Zone Management

The Massachusetts Office of Coastal Zone Management (CZM) is located in the Executive Office of Environmental Affairs. It has been established under and funded by the Coastal Zone Management Act of 1972. The Act is administered by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration (NOAA), in the U.S. Department of Commerce. Its purpose as stated in the CZM legislation is to develop and implement "management programs to achieve wise use of the land and water resources of the coastal zone giving full consideration

42. M.G.L. C. 21, S. 43
43. M.D.L. C. 21, S. 52
44. M.G.L. C. 21, S. 52A
45. M.G.L. C. 91, S. 59B

to ecological, cultural, historic, and esthetic values as well as to the needs for economic development."

To aid in the development of a coastal zone management plan, the Governor appointed a Citizens' Task Force on Coastal Resources. The membership consisted of legislators, cabinet secretaries, environmentalists, utilities representatives, interested citizens, commercial fishermen, businessmen, sportsmen, regional planners, and members of universities. The task force ultimately set forth eleven goals:[46]

(1) develop a coastal zone management program which builds upon the Commonwealth's strong tradition of local government, but which also allows the state to make decisions on matters with far-reaching impacts on the coastal zone, or on the state as a whole.

(2) encourage commercial, industrial, port, and energy facility developments which are required to meet the Commonwealth's social and economic needs, and to locate such developments in the areas which can best absorb those activities without damaging the coastal environment or conflicting with neighboring activities.

(3) improve public access to coastal lands and waters which are important for recreation and leisure activity, and to provide better opportunities for those people now restricted or prevented from enjoying the recreational use of coastal lands and waters.

(4) protect coastal land, water, and living resources of major significance from pollution and overuse, and to preserve from development areas of natural productivity and areas prone to damage from floods and hurricanes.

(5) protect and preserve areas of valued coastal scenic character, especially those areas providing clear unobstructed views of coastal lands and waters.

(6) encourage economic revitalization of urban coastal waterfronts through siting of facilities, redeveloping and restoring ports, and improving physical and visual access to urban waterfronts.

---

46. "Living By The Sea", Massachusetts Office of Local Zone Management, p. 5.

(7) protect coastal water supply, coastal water quality, and coastal air quality as plans evolve for future growth and development.

(8) insure a program that meets local needs by placing emphasis on citizen and community participation in the evolution of a CZM plan and management system.

(9) plan for the potential on-shore and near-shore aspects of Outer Continental Shelf (OCS) oil and gas developments as a part of the Commonwealth's CZM program.

(10) encourage orderly growth in developing areas, and to encourage revitalization and new growth in urban areas with growth potential.

(11) develop a management system sensitive to the Commonwealth's fragile natural resources, and recognizing future economic, social, environmental, aesthetic, and historic needs. The management system should provide for a careful review of developments of regional importance, and provide mechanisms to guide future growth and development.

The Office of Coastal Zone Management is currently in its final year of developing a plan. Once completed and accepted by NOAA, the states will receive funding for the implementation of their plans.

2.2 Other State Agencies

Other agencies also exist at the state and area-wide level that possess authority over harbor activity. State agencies such as the Department of Public Safety in the Executive Office of Public Safety and the Department of Public Health in the Executive Office of Human Services for the most part augment the authority currently in existence in agencies of the Executive Office of Environmental Affairs. The Department of Public Safety then would be concerned with enforcement and safety aspects of harbor and marine regulation. The Department of Public Health in its responsibility for guarding the public health maintains regulatory authority over conditions such as contaminated or polluted tidal waters and flats that endanger

the public health. Some of the regulatory authority previously found in the Department of Public Health's Sanitary Code is now part of the Environmental Code administered by the Executive Office of Environmental Affairs.

XII.3 Regional and Local Agencies

3.1 Regional

Area-wide agencies such as the Metropolitan District Commission and the Massachusetts Port Authority also possess definitive regulatory authority over harbor and marine activities within their geographical area of jurisdiction. Their authority is unique and can be found in the statutes and regulations affecting these two agencies.

3.2 Local Harbor Masters

The principal agent at the local level responsible for harbor and marine activities is the harbor master. The Office of Harbor Master is established through state enabling legislation, Chapter 102 of the Massachusetts General Laws, though several municipalities maintain harbor-master authority through special legislation which predates the general enabling legislation.

The first harbor master position was created in 1847 by an Act of the Massachusetts General Court for the City of Boston. This legislation gave the Mayor of Boston the power to appoint a harbor master who would have the responsibility for regulating certain harbor activities. Six years later, Gloucester in 1853 had passed similar state legislation authorizing the City to establish a harbor master's position. In 1876, Newburyport, New Bedford and Salem followed suit.

Then in 1881, the Massachusetts General Court passed a general enabling law granting all cities and towns similar authority to appoint a harbor master. This statute, Chapter 102 of the Massachusetts General Laws, remains to this day and

provides the harbor master with certain authority to regulate the harbor area: (1) the anchoring of vessels; (2) unloading of lumber; (3) regulating the lower yards, topsail yards, and jib booms of vessels lying in the harbor or at a wharf or pier; (4) removing of vessels within the harbor; (5) removing of vessels occupying a berth at a public wharf or pier; and (6) regulating and stationing all vessels in the streams and channels of the harbor.[47]

Though somewhat outdated, Chapter 102 does establish the position of harbor master and provides certain authority within the Office, more specifically, the power to regulate the anchoring and movement of any vessels in the harbor. Chapters 90B and 91 of the Massachusetts General Laws contribute to the authority of the harbor master by granting control over motorboat activity[48] and allowing for permits for temporary moorings and floats.[49] These statutes grant certain police powers such that a harbor master may arrest without a warrant anyone committing a misdemeanor in or upon any of the rivers, harbors, bays, or sounds of the Commonwealth; board any motorboat and conduct an investigation.

State law doesn't establish minimum professional or experience qualifications for harbor masters or assistant harbor masters. The position of harbor master is not a tenured position although some harbor masters are subject to Civil Service law, such as Boston, or in cases whereby the community has passed a special statute according tenure or where the town has enacted the Veteran's Tenure Law. Any qualifications or standards may be established by local laws. The power of appointment in all cases is the right of a Mayor in a city and the Board of Selectmen in a town. Pay is fixed by ordinance, bylaw, or by vote of the City Council or town meeting.

---

47. M.G.L. C. 102, S. 17-28
48. M.G.L. C. 90B, S. 12
49. M.G.L. C. 91, S. 10A

The only dispute of a harbor master's powers came up in the case of the Town of Scituate vs. Maxwell (339 Mass. 436). The Court ruled that harbor masters have authority over "vessels" but not "structures", in this case a marina. This holds even if the structure consists in part of floats. (See Figure XII.2 for a list of harbor-master communities.)

3.3 Shellfish Authorities and Shellfish Wardens

In each city and town bordering on coastal waters, the mayor or the selectmen shall appoint a person, or persons, qualified by training and experience in the field of shellfishery management, as shellfish constables or deputy shellfish constables. Such shellfish constables and deputies shall be appointed for terms of three years. They shall, subject to the appointing authority, initiate, promote and manage shellfisheries in such city or town, and shall make or cause to be made, such studies as may be necessary to enhance the value of such shellfisheries. They shall enforce all statutes, ordinance, bylaws, rules and regulations relative to shellfish in such city or town.[50]

The selectmen of a town bordering upon coastal waters, if so authorized by their town, and the Board of Aldermen or the City Council of any city so situated may control, regulate or prohibit the taking of eels and any kinds of shellfish and sea worms within such cities and towns and may make any regulations not contrary to law in regard to said fisheries as they deem expedient, including the times, places, methods, purposes, uses, sizes, quantities and other particulars of such taking, and may grant permits and establish fees.[51]

3.4 Other Local Agencies

There also exist other agencies and mechanisms of local government that may be used to control or regulate harbor and marine activity. The local board of health through its regulatory authority over health hazards and the local conser-

---

50. M.G.L. C. 130, S. 98

51. M.G.L. C. 130, S. 52

vation commission with its authority over wetlands and marshes, estuaries and lands subject to tidal action are examples. The community itself can appoint harbor patrol officers, designate police officers or other bodies to have police power authority over coastal waters and marine activities. The city or town can also pass ordinances or bylaws not inconsistent with state or federal law that could further regulate harbor waters and associated activities. Many communities have ordinances or bylaws, or have authorized regulations that provide the harbor master with a greater degree of authority over harbor-related activity. Another control mechanism that could be used is that of zoning the harbor area for certain uses while restricting or having by special permit other uses.

3.5 Harbor Authority

Finally, the local community might consider establishing a "harbor authority". Presently, this could only be possible through a special act of the General Court, but with the home rule doctrine it could receive general approval and speedy passage providing its provisions were considered positive and ones that would not be inconsistent with Coastal Zone Management Plans and traditional values of the general well-being of the residents of the Commonwealth. A weaker but potentially effective variation of this would be a harbor department or harbor commission undertaken solely by local initiative. Any of the above mechanisms would provide a focus of harbor activities and would likely result in a more effective and efficient system of management over marine resources and commercial, recreational and tourist activity. The question of harbor authorities in small communities and other possible means of more formally administering small harbors will be discussed in some detail in the next chapter of this volume.

FIGURE XII.2

MASSACHUSETTS HARBOR-MASTER COMMUNITIES

Amesbury

Barnstable
Beverly
Braintree

Chatham
Cohasset

Danvers
Dartmouth
Dennis
Duxbury

Edgartown
Essex

Fairhaven
Fall River
Falmouth

Gloucester

Harwich
Haverhill
Hingham
Hull

Ipswich

Kingston

Lynn

Manchester
Marblehead
Marshfield
Mashpee
Mattapoisett
Milton

Nahant
Nantucket
New Bedford
Newbury
Newburyport

Oak Bluffs
Orleans

Plymouth
Provincetown

Quincy

Revere
Rockport
Rowley

Salem
Salisbury
Sandwich
Saugus
Scituate
Swampscott
Swansea

Tisbury
Truro

Wareham
Weymouth
Wellfleet
Westport
Winthrop

Yarmouth

CHAPTER XIII: FISHING COOPERATIVES

XIII.1 What is a Fishing Cooperative?

The overall thrust of the study effort has been directed primarily towards small harbor development as embodied in physical development possibilities and public institutional actions. Nonetheless, it was clear from the outset that fisheries cooperatives can play a major role in developing and maintaining a small fishing industry and that such an industry is an important factor in small harbor development.

A fishing cooperative has the same essential features as the more familiar and traditional farm cooperatives and the food purchase cooperatives that have become increasingly popular in recent years. All three are derived from the same basic premise that there are some things that a group of individuals acting together can do "better" than they can acting independently. What constitutes "better" will vary from one situation to the next and from one type of cooperative to another, but "better" may mean more efficiently, more profitably, more cheaply, faster, with less capital per individual, or some other measure of success of the group versus the individual. There may even be some things the group can do that the individual members can't do at all.

In principle and in fact, a cooperative is very much like a corporation - the relevant State and Federal

laws even refer to them as cooperative corporations - but there are several important distinctions between a cooperative and a straight corporation, whether for profit or not. We will discuss those differences in more detail later in this chapter, but for now the main differences to be noted are:

a) Profitability

The cooperative itself shows no profit but rather distributes all excess funds to its members.

b) Representation

Representation is not a function of the proportion of the corporation owned i.e. share holdings. Rather, each member has one vote.

c) Constituency

The cooperative corporation must do more business with members than with non-members.

The final general introductory point to be made about fishing cooperatives, and other types as well, is that the services they perform for their members all fall into the two basic categories of purchasing and marketing. As we shall see, however, the details of the services they provide can represent some rather subtle subsets of these two broad categories.

XIII.2 Why Form a Fishing Cooperative?

The fishing business in Massachusetts and New England, especially in the smaller harbors, has long been a capital shy, labor intensive, and highly fragmented industry with little, if any, vertical integration. Each boat is usually owned by an individual or a family and the owner is typically also the captain or one of the crew members. The capital-shyness shows up not only in a scarcity of investment capital for new boats, major repairs, or equipment purchases but also in a chronic shortness of operating capital that keeps the owner in a continual cash flow crisis. Part of the problem of course derives from the fact that supply is uncertain (Contrary to the popular phraseology, fish are not harvested, they are hunted and caught, and whether or how many of them are caught is subject to many variables, from the weather to just plain luck), but even more fundamentally, the business has simply not been attractive enough to investors to properly capitalize the individual enterprise.

On the other side of the business, the demand for fish exhibits price elasticity, i.e. the market will absorb a certain amount of fish at high price but will only absorb more fish if the unit price drops. Because of this price elasticity, the income to the fisherman does not necessarily rise as he catches more fish and it may even decrease, but in any event it usually will not rise linearly with the amount of fish caught and sold. The many middlemen who separate the fisherman from the consumer operate on relatively fixed margin and are insulated, to a degree, from these price swings; but the fisherman sees their

full effect. Moreover, partially because of his cash flow problems and partially because of the perishability of the product, the individual fisherman usually has no choice but to accept the day's price, no matter how good or bad it is.

It is in this general area of marketing the catch that a fishing cooperative can offer the greatest benefits to its members. A cooperative can assume many, or in some cases, all of the middleman functions and pass all of the relatively fixed profit margins back to the fisherman in the year end poundage rebates. By virtue of its size and financial power, the cooperative can choose markets more carefully than an individual fisherman and shop around for better prices in say, New York, on days when prices in local markets are weak. While an individual fisherman may have wide variations in his catch from day to day, the cooperative membership as a whole will show a much more steady catch rate and thus the cooperative can enter into long term supply contracts with restaurants or retail markets at stable and attractive prices. Equally importantly, the financial strength of the cooperative will permit it to own or lease cold storage space to withold fish from the market on weak price days and sell it only when the price improves. The cooperative may even develop markets not available to individuals. The direct shipment of Atlantic bluefin tuna to Japan is a striking example of how important this capability of a cooperative can be. As a final point concerning the advantages of a cooperative, on the marketing side, a properly capitalized fishing

cooperative can do much to alleviate the cash flow problems of individual fishermen not only by bringing some semblance of stability to the ex-vessel prices but also by guaranteeing that the fisherman is paid for his catch on a regular schedule that is independent of how quickly or slowly downstream middlemen settle their accounts.

All of the above points refer to the marketing functions of a fishing cooperative. There are also possible benefits on the purchasing side, though their overall financial impact is likely to be less. Some co-ops have set up retail stores for their members handling the more common supplies and equipment such as fuel, ice, nets, ropes, foul-weather gear, hooks, and so on. The benefits accrue to the fishermen in two ways. The cooperative store turns its "profits" back to its members and the membership gets the advantage of volume discounts in the retail price they pay. As is the case on the marketing side, there are also some purchasing functions that the cooperative can perform that are nearly impossible for the individual to perform for himself. The establishment and operation of an ice making facility by the Tri-Coastal Tuna Cooperative is a timely example of such a function.

XIII.3 Forming a Fishing Cooperative

There are several legal requirements to be met in the formation and operation of a fishing cooperative, and this chapter can only outline them briefly. Clearly,

a group of fishermen who seriously wish to establish a cooperative will have to retain a competent attorney to handle their particular situation.

In general though, the first step in forming a cooperative is to identify the specific areas where a cooperative can be of benefit to the members of a given fishing community. Some or all of the points raised in the preceding section may be germane or there may be other more specific needs to be met in a given community. It is suggested, however, that a cooperative in formation would best direct its attention to a small number of rather well defined objectives and only expand its role and objectives after it has become established. Once these initial goals are identified, probably through the usual informal discussions among fishermen, then a commitment to join the cooperative must be obtained from a sufficient number of members-to-be. Under Massachusetts law, at least seven members are required but, more realistically, a new cooperative should have many more than this minimum number to have any hope of survival and growth. Discussions with existing cooperatives indicated that not all members will be active members and that there will be attrition as members move, change employment, or simply decide that the cooperative is not for them; and an insufficiently large membership will place too great a financial strain on each individual.

With the goals defined and the potential members lined up, the next step is to select the organizational

format and legally create the cooperative entity. Here again, a group wishing to form a cooperative should consult a lawyer, but there are three basic formats available - a general partnership, a limited partnership, or a corporation. A general partnership is defined as an association of two or more persons who engage in business for profit, with each partner being personally liable for all of the obligations of the entity. A limited partnership is much the same except one or more partners has liability limited to his investment and may not participate in the management of the enterprise. In a limited partnership, at least one person must be a general partner with unlimited liability for the partnership. In a corporation, of course, the liability of all investors is limited to their initial investment. It should be pointed out that general or limited partnerships are usually formed in preference to corporations either for tax purposes or to meet some professional standard or tradition as in the case of accounting firms. Since neither applies here, however, it is likely that a new cooperative will be a corporation as are all existing cooperatives in Massachusetts.

At this point it should be pointed out that any group of fishermen interested in establishing a cooperative would be well advised to contact one or more of the existing cooperatives to draw on their experience in starting and running their organizations. The study team found that these organizations were most helpful and willing to provide such information and all expressed a willingness to assist

fellow fishermen in a similar manner. It may even be more attractive to a formative cooperative to either join an existing organization instead of starting their own or to form some sort of mutual assistance relationship with an established cooperative to grease the ways for their own startup. In any event, the experience of the existing organizations is one of the most valuable resources available to an embryonic cooperative and it should be used fully. A list of the existing cooperatives in the area is shown in Table XIII.3.1.

The capital needs of a cooperative can be met from several sources as we shall see later, but the initial injection of capital for a newly formed cooperative comes from the sale of shares to the charter members. Typically, each member is required to buy at least one share at a nominal fee of say, $100 and may buy more if he wishes, though few do. The by-laws of the cooperative frequently contain the provision of guaranteed buy-back by the cooperative if a member wishes to withdraw, but even in the absence of such a by-law most cooperatives will still buy back as a means of keeping confidence in the cooperative high. Beyond this initial commitment of investment capital, most cooperatives also charge a yearly fee of each member, again a nominal sum of say, $25.

Another essential part of the founding of any organization is the drawing up of a constitution and by-laws. Here again, consultation with an attorney is essential, though the by-laws of the existing cooperatives can be used as a model. Typically, the existing cooperatives operate with a president, vice-president, treasurer, and

Table XIII.3.1

EXISTING COOPERATIVES

Chatham, Massachusetts

Chatham Seafood Cooperative
617-945-1486
Richard N. Larsen, Manager
134 Depot Road
Chatham, Massachusetts 02633
Members: 84 Boats: 41
Type: Marketing and Supplies

Cod
Haddock
Halibut

Fairhaven, Massachusetts

New Bedford Seafood Cooperative Assoc., Inc.
617-996-8539
Jospeh P. Boldiga, General Manager
Fish and Scallop Division
Fairhaven, Massachusetts 02179
Members: 135 Boats: 175
Type: Marketing and Purchasing

Cod
Flounder
Haddock
Scallops

Gloucester, Massachusetts

Gloucester Whiting Association, Inc.
617-283-9369
Dominik Spinola, President
c/o Fishermen's Wharf
37 Rogers Street, Rear
Gloucester, Massachusetts 01930
Members: 70 Boats: 12
Type: Marketing and Supplies

Cod
Haddock
Whiting
Shrimp

Table XIII.3.1 (cont.)

EXISTING COOPERATIVES

Narragansett, Rhode Island

Point Judith Fishermen's Cooperative Assoc., Inc.
401-783-3368
Jacob J. Dykstra, President
P. O. Box 752
Narragansett, Rhode Island 02882
Members: 130 Boats: 61
Type: Marketing and Supplies

Flounder
Lobster
Whiting
Groundfish

New Bedford, Massachusetts

New Bedford Seafood Cooperative Assoc., Inc.
617-993-9926
Leif Jacobsen, President
(Fuel Division), Co-op Wharf
New Bedford, Massachusetts 02740
Members: 135 Boats: 175
Type: Marketing and Supplies

Cod
Flounder
Haddock
Scallops

Newburyport, Massachusetts

Tri-Coastal Seafood Cooperative, Inc.
617-465-8188
David Fyrberg, General Manager
P. O. Box 649
Newburyport, Massachusetts 01950
Type: Marketing

Tuna

Table XIII.3.1 (cont.)

EXISITNG COOPERATIVES

Saugus, Massachusetts

The Atlantic Lobstermen's Cooperative, Inc.
627-233-2642
Fred A. Wilson, Manager
134 Ballard Street — Lobster
Saugus, Massachusetts 01906
Members: 425 Boats: 350

secretary and a strong board of directors meeting on a bi-weekly or monthly basis. The full membership usually only meets annually. All of the existing cooperatives in the Commonwealth also have a salaried business manager (with this or another title) who runs the cooperative on a daily basis with a great deal of autonomy. Based on our discussions with existing cooperatives, the study team strongly recommends that the business manager, whether full time or part time, should be a professional who has at least a familiarity with the fishing business but is not a practicing fisherman. Knowledge of fishing is helpful, but business management skills are much more important. Also, depending on the size and success of the cooperative and the size of its paid staff, the treasurer and secretary could and probably should be employees of the cooperative rather than members.

XIII.4 Operating a Fishing Cooperative

The actual details of operation of a cooperative vary significantly from one to another based on many factors such as size, species fished and handled, marketing method, seasonality, and the preferences of the members. A new cooperative will have to tailor its operating method to its own peculiar circumstance, but there are a few suggestions that will probably be generally applicable.

The division of labor among the general membership, the officers and board of directors, and the paid staff

including the business manager is fairly standard among the existing cooperatives. The business manager has the responsibility of day-to-day operations including hiring his authorized support staff; running the coop office and other facilities; arranging for collection, storage, transportation and sale of the catch; marketing the catch and negotiating prices; and establishing the ex-vessel price each day based on his best estimate of the sales price and allowances for cooperative expenses. The board of directors hires and supervises the business manager; makes most policy decisions on behalf of the general membership; approves or disapproves capital expenditure proposals of the business manager; authorizes debt or other annual decisions to the general membership for its approval. The general membership normally meets only annually for the election of officers and the usually automatic approval of board recommendations such as the patronage rebate level.

To digress for a moment, the patronage refund is the mechanism whereby the excess funds of the cooperative are returned to its members. In a regular business corporation these excess funds would be called profits and the corporation could either hold them within the corporation as retained earnings or could pay the funds to the investors in proportion to their ownership of the corporation as dividends. In either case, the profits are subject to State and Federal corporate income taxes. A cooperative corporation, on the other hand, makes no profit itself and is not liable for corporate taxes but rather returns

all of its excess funds to its members in proportion to the amount of business each has done with the cooperative. Since most cooperatives are predominately marketing cooperatives this usually means that the patronage rebate is set at so much per pound of fish sold to the cooperative. As an example, a cooperative with excess funds at year end of $100,000 and total fish handlings for the year of two million pounds might declare a poundage rebate of 5¢ per pound. Then a member who sold 100,000 pounds to the cooperative over the year would be entitled to a $5,000 rebate. It should be borne in mind, however, that it is umcommon and unwise for all excess funds to be paid out as rebates. Rather, a significant portion is first set aside as operating capital for the cooperative itself. Also, cooperatives that handle several differect species usually have different cost centers for each species or group of species and set separate rebate levels for each cost center to account for the wide differences in ex-vessel prices between, for example, bluefin tuna and herring.

As we have already noted, the actual mode of operation of a cooperative will depend on many variables, but there are some points that appear to be universally important. Perhaps the most important come under the general heading of member discipline and bears some discussion. In joining a fishing cooperative of the type we have been discussing, the individual fisherman is essentially becoming a party to an exclusive sales agreement. He is guaranteeing to sell all of his catch to the cooperative, under a fixed set of rules, in return for which the cooperative promises to pay him promptly at the going rate for

the day and to market his catch along with that of his fellow members in such a way as to keep the ex-vessel price as high as possible. The fisherman and the cooperative are short circuiting some private businesses in the sale, storage, handling, and transportation of fish and it is not suprising that some businessmen who have been affected by the establishment of a cooperative will take steps to reacquire some of their lost business and, not coincidentally, weaken the co-op in the process. The most common approach is to offer ex-vessel prices a penny or two above those being offered by the cooperative, either to all comers or to a few key members of the co-op. If the members are able and willing to accept a small short term gain like this, then the long term effect is to undermine the stability of supply of the cooperative and to weaken its marketing position with its downstream purchasers. Perhaps more disturbing, the outside businessman will usually try to limit his purchases from cooperative members to the highest quality fish and leave the rest to be bought by the cooperative at the fixed price for the day. This can both lower the average price the co-op receives and hurt its reputation with its buyers. To avoid these negative effects, the cooperative must maintain strict disciplike with its members and penalize or suspend any member who violates his exclusive sales contract.

Another area where co-op discipline is important is in the handling of the catch. The Massachusetts fleet deals heavily in high-valued premium food fish, whether

round or filleted, and it is a delicate product that requires care in handling to get consistently high prices. Ideally, it should not be handled by pick at all, but the ideal has proved nearly impossible to achieve or enforce. The more important quality control device is proper icing of the catch to assure its freshness. For the larger boats which fish Georges Bank, the five to ten day trips make proper icing not only desirable but essential since their product would not just lose some quality but would completely spoil if not iced. The boats that operate out of small harbors are usually day trippers however, and for much of the year they can get away with little or no ice and not lose the product completely, though its quality will decline somewhat.

One of the real advantages a small boat fleet has over its Boston/Gloucester/New Bedford counterparts, however, is that its product is fresher and can thus command a premium price per pound to offset the higher unit costs of a small boat versus a larger one. Nonetheless, ice is an expense that the individual fisherman may decide to forego and it is highly advisable for the cooperative to exercise some discipline to assure that he does not forego it and endanger the fleet reputation for quality and freshness. One possibility is for the cooperative to refuse to buy fish that is not properly iced or, for those cooperatives that have ice making facilities, to charge the individual for ice at a standard rate per trip so that he has no financial incentive to avoid using it. Whatever mechanism is chosen however, the cooperative

must in some way assure that the inevitable short term self interest of the individual members is not allowed to act counter to the long term interests of the membership as a whole.

XIII.5 Financing a Fishing Cooperative

There are seven basic sources of investment and operating capital that are routinely and directly available to a fishing cooperative. In addition, there are a large number of State and Federal programs that, while they generally do not benefit cooperatives directly, can be of substantial indirect benefit in providing low cost leased facilities to the cooperative, assisting members with loans, or providing technical or management assistance. These supplemental programs and resources are presented in Attachment B to this chapter and the seven main sources of capital for cooperatives themselves are as follows:

a) Capital Stock

As we have noted, each member of the cooperative is required to purchase one share of stock, and the proceeds from that stock sale provide the seed money for the establisment and operation of the cooperative. The amount of money involved is usually only a nominal amount, however, and the total proceeds from stock sale are in no way sufficient to meet a significant part of the capital needs of a cooperative. The same, by the way, is true of most corporations.

b) Annual Fees

Most cooperatives charge their members an annual fee that presumably spreads the fixed overheads of the cooperative more equitably among the active and relatively inactive members. As with the stock price, however, the annual fee is usually only a token amount.

c) Purchasing/Marketing Float

The cooperative sells the catch to wholesalers or other downstream purchasers either for cash or short term invoicing and usually only pays its members their ex-vessel prices a few days later. Because of this brief time lag and the fairly constant throughput of fish and cash, the cooperative will always have a certain amount of cash on hand that has been collected from purchasers but not yet paid to members. This marketing float can meet some of the operating capital needs of the organization. For those cooperatives that also provide purchasing services to their members, there may also be a purchasing float due to the fact that members will usually buy supplies for cash or deductions from current settlements while the supply vendors are paid on net-30-day invoices. Again, the purchasing float will meet some of the cash needs of the cooperative.

d) Annual Rebates

Cooperatives are by their nature non-profit organizations and any excess of receipts over expenses is distributed to members as patronage rebates. The rebates are only declared annually however, and actually may not be disbursed until some months after declaration. In the meantime, the funds that are to be rebated are held by the cooperative itself and are available for use as operating capital.

e) Commercial Loans

As with any other person or business, a cooperative may borrow money from commercial banks at commercial rates. Such loans may be collateralized mortgages on capital equipment or revolving credit lines for operating capital secured by accounts receivable. The latter type of loan will be difficult to obtain for a new cooperative with no credit history but secured mortgages are relatively easy to obtain even for a new organization.

f) Farm Credit System

Under PL 92-81m fishing cooperatives are able to obtain loans from the Farm Credit System (in this case the Springfield Bank for Cooperatives) for nearly any capital need, whether for operating cash or capital improvements. Rates and terms are flexi-

ble and negotiable over a range of 7¼ - 8¼% for repayment terms of 15 years to 6½ - 7½% for 18 month repayment.

g) Member Loans

In addition to these basically external sources of debt, a cooperative may also borrow from its members, either voluntarily or by by-law. The loans may be straight loans against notes or they may be indirect loans as deductions from settlements or rebates. In the former case, one approach that has been used is to hold back a fixed percentage of all settlements, say 2%, to be repaid at the end of the fiscal year or at some other predetermined time in the future. In the latter case, the loan can be a simple holdback or reduction in the annual rebate or can be a payment of part of settlements or rebates in scrip redeemable through the purchasing side of the cooperative. It should be noted, however, that the use of scrip or the other forms of loans from members though deductions defers the time when they receive their proceeds from sale of catch but does not defer their tax liability from such proceeds. Because of this, most cooperatives tend to avoid member loans unless they are absolutely essential.

Attachment A: Federal and State Laws Relevant to Fishing Cooperatives

As we have noted in this chapter, a group of fishermen wishing to found a cooperative will ultimately have to retain competent legal counsel, but as background to that step, interested fishermen and public officials may wish to familiarize themselves with the relevant Federal and State Laws.

XIII.A.1 Federal Fishery Cooperative Regulations

Although each state has some laws regulating fishery or general cooperatives, the Fishery Cooperative Marketing Act of 1934 is the broad legal framework within which all fishery cooperatives must organize and operate.

Any group of fish and shellfish producers organized and operating in compliance with its provisions, is considered a fishery cooperative within the meaning of the Act.

Origin

The Act is patterned after the Capper-Volstead Act, which was approved by Congress in 1922. It is designed to give fishermen the authority to organize cooperatives to market aquatic products harvested from their native habitat or from seed beds and reservoirs prepared by producers.

Purpose

The Capper-Volstead Act and Fishery Cooperative Marketing Act were enacted to permit farmers or fishermen respectively to unite legally in marketing contract agreements to sell their products under mutually agreeable conditions. Without these two Acts, farmers' and fishermen's associations could not have entered into marketing agreements specifying conditions of sale without violating existing antitrust laws. Fishermen are mostly independent vessel or boat owners who, without the Act, could not unite to negotiate terms and conditions of sale for their aquatic products.

Requirements

The Fishery Cooperative Marketing Act does not impose a specific form of operation on groups of fishermen orgainzed under its provisions. Cooperatives may be incorporated or unincorporated. State Laws, however, may, and usually do, prescribe specific forms of incorporation for these organizations.

The marketing services that a cooperative may perform for members are not limited by the Act. Restrictions on price determination functions, however, are imposed by law or by rules of ethics of good business practice. A cooperative limiting its activities to price determination functions, without acquiring title of the landed products, is restricted on how these should be performed. Actions that monopolize or restrain trade

in interstate or foreign commerce by unduly enhancing aquatic commodity prices are prohibited by the Act.

The National Marine Fisheries Service checks each cooperative for compliance with the provisions of the Fishery Cooperative Marketing Act. A National Marine Fisheries Service representative usually visits cooperatives once a year to check compliance and obtain information on their management, production, and service activities.

Organizations doing business as cooperatives are required to comply with the Fishery Cooperative Marketing Act. Under the Act, cooperatives must conform with both of the following requirements. First, no member of the cooperative is allowed more than one vote, regardless of the number of shares of stock or his membership capital; or the cooperative may not pay dividends in excess of eight percent per year on stock or membership capital. Second, the cooperative may not deal in the products of non-members in an amount greater in value than that handled for members. The first provision contains two requirements. Cooperatives may comply with either requirement but are not required to comply with both.

FISHERY COOPERATIVE MARKETING ACT

Authorizing associations of producers of aquatic products.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that persons engaged in the fishing industry, as fishermen, catching, collecting, or cultivating aquatic products on public or private beds, may act together in associations, corporate or otherwise, with or without capital stock, in collectively catching, producing, preparing for market, processing, handling, and marketing in interstate and foreign commerce, such products of said persons so engaged.

The term "aquatic products" includes all commercial products of aquatic life in both fresh and salt water, as carried on in the several States, the Disrict of Columbia, and several Territories under the jurisdiction of the United States. Such associations may have marketing agencies in common, and such associations and their members may make the necessary contracts and agreements to effect such purposes: Provided, however, that such associations are operated for the mutual benefit of the members thereof and conform to one or both of the following requirements:

First. That no member of the association is allowed more than one vote because of the amount of stock or membership capital he may own therein; or

Second. That the association does not pay

> dividends on stock or membership capital in excess of 8 per centum per annum.

and in any case to the following:

> Third. That the association shall not deal in the products of non-members to an amount greater in value than such as are handled by it for members.

Section 2. That if the Secretary of Commerce shall have reason to believe that any such association monopolizes or restrains trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof, he shall serve upon such association a complaint stating his charge in that respect, to which complaint shall be attached, or contained therein, a notice of hearing, specifying a day and place not less than thirty days after the service thereof, requiring the association to show cause why an order should not be made directing it to cease and desist from monopolization or restraint of trade. An association so complained of may at the time and place so fixed show cause why such order should not be entered. The evidence given on such a hearing shall be taken under such rules and regulations as the Secretay of Commerce may prescribe, reduced to writing, and made a part of the record therein. If upon such hearing the Secretary of Commerce shall be of the opinion that such association monopolizes or restrains trade in interstate or foreign commerce to such an extent that the price of any aquatic

product is unduly enhanced thereby, he shall issue and cause to be served upon the association an order reciting the facts found by him, directing such association to cease and desist from monopolization or restraint of trade. On the request of such association or if such association fails or neglects for thirty days to obey such order, the Secretary of Commerce shall file in the district court in the judicial district in which such association has its principal place of business a certified copy of the order and of all the records in the proceedings together with a petition asking that the order be enforced and shall give notice to the Attorney General and to said association of such filing. Such district court shall thereupon have jurisdiction to enter a decree affirming, modifying, or setting aside said order, or enter such other decree as the court may deem equitable, and may make rules as to pleadings and proceedings to be had in considering such order. The place of trial may, for cause or by consent of parties, be changed as in other cases.

The facts found by the Secretary of Commerce and recited or set forth in said order shall be a prima facie evidence of such facts, but either party may adduce additional evidence. The Department of Justice shall have charge of the enforcement of such order. After the order is so filed in such district court and while pending for review therein, the court may issue a temporary writ of injunction forbidding such association from violating such order or any part thereof. The court shall, upon conclusion of its hearing, enforce its decree by a permanent injunction or other appropriate remedy. Service of such complaint and of all notices may be made upon such associa-

tion by service upon any officer, or agent thereof, engaged in carrying on its business, or on any attorney authorized to appear in such proceeding for such assocaition, the officers and members thereof.

Approved June 25, 1934

XIII.A.2 Massachusetts Fishing Cooperative Laws

CHAPTER 157

CO-OPERATIVE CORPORATIONS

CO-OPERATIVE BUSINESS CORPORATIONS

Sec.

1. Method of organization.
2. Distribution of earnings or profits; sinking fund; limitation upon shares held.

CO-OPERATIVE AGRICULTURAL, DAIRY OR MERCANTILE ASSOCIATIONS

3. Organization; name.
3A. Housing business; powers; name.
3B. Direct-charge cooperatives.
4. Capital stock; powers; by-laws; meetings.
5. Investment of reserve fund.
6. Apportionment of earnings.
7. Acceptance of provisions relating to agricultural, dairy or mercantile associations; approval.
8. Use of word co-operative in connection with other businesses; penalty.
9. Fee for filing articles of organization.

AGRICULTURAL AND OTHER CO-OPERATIVE CORPORATIONS WITHOUT CAPITAL STOCK

10. Organization without capital stock; method of organization; rights and powers of members.
11. Powers.
12. First meeting; selection of directors.
13. Scope of by-laws; amendment or repeal of by-law.
14. Membership.
15. Amendment or alteration of agreement of association or articles of organization.
16. Marketing contracts between corporation and members.
17. Marketing contracts; provisions for liquidated damages; injunction for breach.
18. Taxation; filing fees.

NOTE: This is an abridged version of Chapter 157. Historical footnotes and other notations that appear in the published versions of the law have been eliminated for reading clarity. Readers are urged to seek legal assistance for clarification of the law if they desire to establish a fishing cooperative under M.G.L., Chapter 157.

CO-OPERATIVE BUSINESS CORPORATIONS

§ 1. Method of organization

A corporation may be organized under chapters one hundred and fifty-five and one hundred and fifty-six, with shares having par value, for the purpose of co-operation in carrying on any business and of co-operative trade.

§ 2. Distribution of earnings or profits; sinking fund; limitation upon shares held

Such corporation shall distribute its earnings or profits among its workmen, purchasers and stockholders at such times and in such manner as its by-laws prescribe, but at least once in every twelve months. No distribution shall be made, unless at least ten per cent of the net profits have been appropriated for a contingent or sinking fund, until an amount has accumulated equal to thirty per cent of its capital stock issued and outstanding. No person shall hold shares in any such corporation to an amount exceeding one thousand dollars at their par value, nor shall a stockholder be entitled to more than one vote upon any subject.

CO-OPERATIVE AGRICULTURAL, DAIRY OR MERCANTILE ASSOCIATIONS

§ 3. Organization; name

Seven or more persons, residents of the commonwealth, may associate themselves as a corporation, association, society, company or exchange, to conduct within the commonwealth any agricultural, dairy or mercantile business on the co-operative plan. The word "co-operative" shall form a part of the name of the corporation, and, for the purposes of this and sections three A to nine, inclusive, the words "association", "company", "exchange", "society" and "union", shall have the same signification and shall import a corporation. The corporation shall be formed as provided in chapters one hundred and fifty-five and one hundred and fifty-six, with shares having par value, and shall be subject to the provisions thereof so far as consistent with said sections.

§ 3A. Housing business; powers; name

Seven or more persons, residents of the commonwealth, may associate themselves as a corporation, association, society or company to conduct within the commonwealth a housing business on the co-operative plan, including the buying, selling, leasing, construction or rehabilitation of dwellings, together with appurtenant facilities, for the members of such co-operative corporation. Such facilities appurtenant to the provision of dwellings shall include use of land and buildings for business, commercial, cultural or recreational purposes related to such dwellings. The words "co-operative" and "housing" shall form a part of the name of the corporation, and, for the purposes of this and sections four to nine, inclusive, the words "association", "company", "society" and "union", shall have the same signification and shall import a corporation. The corporation shall be formed as provided in chapters one hundred and fifty-five and one hundred and fifty-six, with shares having par value, and shall be subject to the provisions thereof so far as consistent with said sections.

§ 3B. Direct-charge cooperatives

Seven or more persons, residents of the commonwealth, may associate themselves as a corporation, association, society or company engaging in cooperative purchasing of goods for the personal use and consumption of the stockholders thereof, members of their families and their guests. A corporation organized under this section shall, in pricing its goods, make no provision for earnings, the accumulation of capital, or operating costs, and shall provide for its operating costs by levying upon its shareholders a direct-charge therefor, on a pro rata basis. The words "direct charge" and the word "cooperative" shall form a part of the name of the corporation, and for the purposes of this section and sections four to nine, inclusive, the words "association", "company", "society" and "union" shall have the same signification and shall import a corporation. The corporation shall be formed as provided in chapter one hundred and fifty-six B, with shares having par value, and shall be subject to the provisions thereof so far as consistent with said sections.

§ 4. Capital stock; powers; by-laws; meetings

The capital stock of a co-operative corporation formed under section three, three A or three B shall not be less than one hundred dollars nor more than five million dollars. No stockholder shall own shares of a greater par value than one tenth of the total par value of the capital stock issued and outstanding, nor shall any member be entitled to more than one vote on any subject arising in the management of the corporation.

In addition to the powers granted by section thirteen of chapter one hundred and fifty-six, any corporation organized under section three, three A or three B may provide in its by-laws for the election of directors and other officials by unit or district or by mail ballot; for a method of membership representation by annual election of delegates to represent proportionately the members of such units or districts in the membership meeting of the corporation, and shall hear reports of and instruct the delegates on the policy and business of the corporation. The agreement of association or the articles of organization shall be altered or amended, and the by-laws shall be altered, amended or repealed, if the delegate type of membership meeting is adopted by any such corporation, only after notice of the proposed action is given in the call for the annual meetings of the units or districts at which the delegates are to be elected to the membership meeting of the corporation, or in the call for the annual election of such delegates if the vote is to be taken by mail ballot, and only upon vote of two thirds of the delegates eligible to vote at such membership meeting. Special meetings of the units or districts may be demanded by written petition of at least one tenth of the membership of any such unit or district for the purpose of instructing its delegate or delegates on questions concerning the operation and business of the corporation, in which case it shall be the duty of the clerk or secretary of the corporation to call such unit or

district meeting or meetings to take place within thirty days after such demand. The minutes of such unit or district meeting shall be forwarded by the clerk or secretary of such meeting to the clerk or secretary of the corporation and be kept at the principal place of business in the commonwealth.

§ 5. Investment of reserve fund

At any regular meeting, or at any duly called special meeting, at which a majority of its stockholders are present, a corporation formed under section three may authorize the investment of its reserve fund or any part thereof, first, in the building where it is doing business, or, second, in a first mortgage of real estate owned and occupied as a dwelling by any of its stockholders.

§ 6. Apportionment of earnings

The directors of every corporation formed under section three or under section three A shall apportion its earnings in the following manner:

1. They shall set aside annually not less than ten per cent of its net profits for a reserve fund until there is accumulated in said reserve fund an amount not less than thirty per cent of its paid-up capital stock.

2. They shall declare and pay dividends on the paid-up capital stock not exceeding seven per cent per annum.

3. From the balance of its annual net earnings the directors may appropriate a sum not exceeding five per cent thereof to be used in teaching co-operation.

4. The directors shall distribute the remainder of such earnings or any part thereof by a uniform dividend upon the amount of purchases or rents or sales of shareholders, through the corporation, and, if the directors so vote, upon the amount of wages earned and paid to employees, except that in the case of a purchaser not a shareholder, who desires to become such, a dividend of one half the uniform dividend may be declared upon such non-shareholder's purchases, or rents or sales and credited to him on account of the purchase of stock for which he may subscribe. In productive corporations, including creameries, canneries, storages, factories and the like dividends shall be calculated on raw materials delivered to the corporation instead of on goods purchased. If the corporation be both a purchasing and a selling, or a productive concern, the dividends may be on both raw material and on goods purchased. The profits or net earnings of such corporation shall be distributed to those entitled thereto at such times as the by-laws prescribe, but at least once in every twelve months.

§ 7. Acceptance of provisions relating to agricultural, dairy or mercantile associations; approval

Any co-operative association now organized by law in the commonwealth for any of the purposes mentioned in section three, and qualified so to do, may by a majority vote of the stockholders at a meeting called therefor vote to accept sections three to seven, inclusive, and shall thereupon present to the state secretary a certificate, signed and sworn to by its clerk or secretary, setting forth a copy of said vote, the date when passed, and such further evidence as the secretary may require of its legal existence and of its intention to accept said sections. The secretary shall examine the certificate and evidence of organization, and, if it appears that the law has been complied with, shall so certify, and shall approve the certificate by his endorsement thereon, and thereupon such corporation shall have the powers and privileges and be subject to the duties and liabilities of corporations formed under section three. Upon the payment of ten dollars, said certificate shall be filed in the office of the state secretary.

§ 8. Use of word co-operative in connection with other businesses; penalty

Any person, partnership, association or corporation, domestic or foreign, except co-operative banks and corporations organized under section ten, transacting business for profit in the commonwealth under any name or title containing the word "co-operative", unless the net earnings thereof are distributed in a manner permitted for a co-operative corporation by this chapter, shall forfeit to the commonwealth not more than ten dollars for every day or part thereof during which such name or title is so used. Such forfeiture may be recovered by an information brought in the supreme judicial or superior court by the attorney general, at the relation of the state secretary. Upon such information, the court may issue a temporary or permanent injunction restraining such person, partnership, association or corporation from doing business in the commonwealth, or from so using such name or title, and may make such other orders and decrees as justice and equity may require.

§ 9. Fee for filing articles of organization

The fee for filing the articles of organization required by section three or section three A, including the issuing by the state secretary of the certificate of incorporation, shall be one twentieth of one per cent of the total amount of the authorized capital stock as fixed by the articles of organization, but in no case less than fifty dollars.

Amended by St.1949, c. 378, § 6; St.1957, c. 698, § 6.

AGRICULTURAL AND OTHER CO-OPERATIVE CORPORATIONS WITHOUT CAPITAL STOCK

§ 10. Organization without capital stock; method of organization; rights and powers of members

Agricultural and horticultural associations engaged in any branch of agriculture, horticulture, viticulture, forestry, dairying, the raising of livestock or poultry and any other farming activity or business, if instituted for the mutual benefit of their members and formed for the purpose of doing business without profit to the association itself may be incorporated without capital stock. Such corporations shall be formed in the manner provided by chapters one hundred and fifty-five and one hundred and fifty-six and shall be subject to the provisions of said chapters, so far as applicable. Members of corporations so organized shall have the rights and powers and be subject to the duties and liabilities of stockholders of corporations having capital stock, under the provisions of said chapters, so far as is consistent with this and the eight following sections.

§ 11. Powers

Any corporation organized under the preceding section shall have power to mortgage or pledge its real or personal property and to issue promissory notes or other evidences of indebtedness. Such corporation shall also have power to establish reserves and invest the funds thereof in such manner as it may deem advisable or as may be provided in its by-laws; and to exercise all other powers, rights and privileges necessary or incidental to the purposes for which said corporation was organized or to the activities in which it is engaged; provided, however, that no such corporation shall handle the products of any non-member, except for storage.

§ 12. First meeting; selection of directors

The first meeting of the corporation shall be held within six months after the execution of the agreement of association. If the directors of the corporation have been previously chosen in anticipation of its organization, or in connection with a plan for preliminary organization, or in accordance with contracts made in anticipation of such organization, such choice of directors shall be ratified at said

§ 13. Scope of by-laws; amendment or repeal of by-law

In addition to the powers granted by section thirteen of chapter one hundred and fifty-six, any corporation organized under section ten may provide in its by-laws for the election of directors by districts; for the election of advisory directors who are not members, the number of whom shall not be greater than one fifth the total number of directors; for voting of members by proxy, and the mode thereof, within such limitations and restrictions as may be specified therein; for voting of members by mail in elections and on questions concerning the operation and business of the corporation; for the admission, withdrawal, suspension or expulsion of members; for dues and assessments to be paid by members and the conditions under which such dues and assessments shall be imposed and collected; for determining the rights and interests of members in the property of the corporation, whether equal or unequal; for establishing the basis of voting by the members, especially whether the votes of all members shall be equal, or in proportion to the land area leased or used by each member for production of the products handled by the corporation, or in proportion to the quantity of such products delivered by each member to the corporation during the preceding year; for an approved or established form of marketing contract; and for fines or other penalties for violation of its by-laws or marketing contract. No by-law shall be amended or repealed nor any new by-law adopted, unless notice of the proposed action is given in the call for the meeting at which the proposal is to be considered, or in the call for the vote if the vote is to be taken by mail.

§ 14. Membership

Membership in such corporations shall be limited to persons engaged in the production of products which are handled or to be handled by the corporation, as specified in its articles of organization, including the lessees or tenants of land used for the production of such products and lessors or landlords to whom are due all or any part of such products produced on leased or rented premises in payment for the use of such premises. If a member is a corporation, it may be represented by any officer thereof, duly authorized in writing.

§ 15. Amendment or alteration of agreement of association or articles of organization

Any such corporation may amend or alter its agreement of association or articles of organization in the manner provided by sections forty-one to forty-three, inclusive, of chapter one hundred and fifty-six, so far as applicable; provided, that such amendment or alteration shall require a vote of three fourths of the members present and voting at a meeting of the corporation called to consider such amendment or alteration, or if the vote upon such amendment or alteration is taken by mail, by vote of three fourths of the members who return votes. A vote by mail upon such amendment or alteration shall not be valid unless votes are returned by at least three fifths of the members of the corporation.

§ 16. Marketing contracts between corporation and members

Any such corporation may enter into marketing contracts with its members by which the members shall agree to sell, for any period of time not exceeding ten years, all or any specified part of their products or of certain specified products exclusively to or through the corporation or any agency designated by it. If such contract provides for a sale to the corporation, title to the products covered thereby shall pass to the corporation absolutely, except for recorded liens, upon delivery or at any other time specified in said contract, if expressly so agreed therein. Any such contract may, however, provide for sale by the corporation of the products of its members with or without acquisition of title to such products by the corporation and may further provide that the corporation shall pay over to the members the resale price after deducting all necessary expenses including any allowances, contributions or deductions authorized by its by-laws or by the contract itself. Such contract shall not be construed as a violation of any provision of sections one to seven, inclusive, of chapter ninety-three, unless it results in an undue enhancement of the price of the product to which the contract applies, nor shall any corporation organized under section ten be liable to prosecution for any action reasonable and proper in the exercise of the rights and powers conferred by sections ten to eighteen, inclusive.

§ 17. Marketing contracts; provisions for liquidated damages; injunction for breach

The marketing contract may fix as liquidated damages specific sums to be paid by a member upon breach of the provisions of said contract requiring sale or delivery of products by the member exclusively to or through the corporation or any agency designated by it, and such provision shall be valid and enforceable in the courts of the commonwealth. Any such corporation may be granted a temporary or permanent injunction against a member for breach or threatened breach of such contract with reference to the said provisions for sale or delivery of products.

§ 18. Taxation; filing fees

A corporation organized under the provisions of section ten, and any corporation, association or organization now or hereafter established, organized or chartered without capital stock for a similar purpose under laws other than those of this commonwealth, shall not be liable to taxation under the provisions of chapter sixty-three, but shall be taxable under the provisions of chapter fifty-nine, in the same manner and to the same extent as an individual or partnership. The fee for filing the articles of organization required by section ten, including the issuing by the state secretary of the certificate of incorporation, shall be fifty dollars.

Attachment B: Funding and Other Resources

There are a number of Federal, State, and Regional sources of funds and other resources that can be of benefit to a fishing cooperative in its formative stages or in its operations. Not all of there programs are directly beneficial to cooperatives themselves but may instead benefit the cooperatives indirectly either through assistance to members or through grants to public agencies in the community where the cooperative operates. Both types of indirect benefits can have substantial impact on the success of a cooperative. It is also true that several of the funding programs at the Federal level are currently inactive or unfunded, but they are included nonetheless in case of future reactivation under the impetus of the 200-mile limit.

XIII.B.1 Federal Programs - National Marine Fisheries Service (NMFS)

Capital Construction Fund

Pursuant to the Merchant Marine Act (46 USC Sec. 1177) any US citizen who owns or leases a vessel of five tons or greater and earns a significant income from fishing may defer a portion of his/her taxable income and deposit the funds in a Capital Construction Fund. The Fund, as approved by the National Marine Fisheries (NMFS), may be used for capital investment in the equipment necessary to fish (e.g., the boat). This deferral may run for a period

of seven to ten years.

> An applicant may deposit: 1) 100% of taxable earned income from the vessel's operation; 2) any capital gains; 3) 100% of the vessel's depreciation; 4) 100% of the earnings from investment or reinvestment of amounts deposited.

Generally, a minimum deposit of 2% of the equipment cost and no reconstruction of less than $100,000, or 20% of the vessel's acquisition cost, can qualify for fund money. The fund money is exempt from federal income tax and although not formally exempt from state taxes, it has not yet been subjected to state assessment. A reconstruction project, by definition, must substantially prolong the life of the vessel.

Fishing Vessel Obligation Program

FVOP was enacted pursuant to the Merchant Marine Act, (46 USC secs. 1271-1279), and guarantees up to 75% of the cost of constructing, reconstructing, or reconditioning a US commerical fishing vessel of at least five tons. Under limited conditions, the guarantee extends to the purchase of a ship's equipment and on-shore support facilities. However, the borrower must own a vessel which can serve as appropriate collateral for the loans.

The applicant must provide at least 25% of the required capital himself. If that amount is borrowed as well,

the second "lender" must agree to recognize the priority position of the National Marine Fisheries Service in the event of default.

The loan guarantee can run for the "useful life" of the vessel. This is commonly held to be 15 years for a new vessel, or 7 years for a reconstructed one, but in no event longer than 25 years. Interest rates are at 9% per annum as set by the Secretary of Commerce, and the NMFS may take a security interest to protect its risk, including interest in the boat.

The applicant must demonstrate: that the vessel is seaworthy; that he/she has the necessary integrity, experience, financial resources, and ability to operate it; that the proposal is economically sound; and, that the project is consistent with the intent of the program. Economic sufficiency is assumed when the applicant can provide sufficient capital to support operation and normal contingencies (at least 8% of the total capitalized cost of the vessel). The applicant must have financial resources equal to the difference between the actual cost of construction, reconstruction, or reconditioning and the amount of the obligation proposed for guarantee. In addition, the applicant must have made adequate provision for payment for the first year's premium for vessel insurance (including hull and manchinery, breach of warranty, protection and indemnity, if applicable, and other insurance that may be required by National Marine Fisheries).

program of direct loans for the financing and refinancing, for purchasing, construction, equipping, maintaining, repairing, or operating new or used commercial fishing vessels or gear. Loans were available to any US citizen who owned, operated, or was about to own a commercial fishing vessel or gear to be used directly in commercial fishing operations. Fishing cooperatives were eligible to receive loans under this program.

The applicant was required to present evidence that he/she could not secure financial assistance on reasonable terms from other sources. The ceiling on this program was low, $40,000 with a fixed interest rate of 8% over a period of ten years. If used to construct a new vessel the repayment period was extended to 14 years. Finally, loan insurance and security were at the discretion of the NMFS.

Import Duties Fund

Presently, under the authority of 15 USC Sec. 713c, 30% of the gross receipts collected by U.S. Customs on fisheries products are paid over to a fund managed by the Secretary of the Interior. This fund is to be used by the Secretary to "promote the free flow of domestically produced fisheries products" by conducting a fishery educational service, and fishery technological, biological, and related research programs. This $10 million fund is traditionally used to cover the expenses of NMFS and is presently unavailable for other purposes.

XIII.B.2 Economic Development Administration (EDA)

Business Development Loan Program

Loans are available from the EDA for up to 65% of the project cost, but are available only when the applicant can provide 15% of the total cost and then secure the remaining 20% from non-federal sources. The loans are to be used to acquire fixed assets and are most appropriately applied to the financing of on-shore facilities such as processing plants and freezers. Normally, loans are made to private businesses.

Title IX

This is a grant program administered by EDA under the Public Works and Economic Development Act, USC Sec 3121 et seq. The grants may be distributed to either a redevelopment area or an economic development district (as defined under the Act), an Indian tribe, the Governor of a state or his/her designated agency, or a consortium of political subdivisions under Titles I and II of the Act; however, these recipients may redistribute the funding to public and private (not-for-profit) entities in the form of grant loans, loan guarantees, etc. The grants may be used for the acquisition or development of land and improvements to public works facilities. Eligible facilities may be constructed, rehabilitated, altered, expanded, or improved with these funds.

A 25% matching share, cash or in-kind, is required and an eligible recipient must have a plan of planning application

approved by EDA. Such plans must be comprehensive, include an environmental impact assessment, and be submitted for the Federal-State coordinating review process under OMB Circular A-95.

The program is funded for FY 1977 at $45 million and there is currently one project of $3 million pending for Massachusetts. The Cape Ann Fisherman's Fund Project as well as other projects conducted by the Overall Economic Development Connittee of Cape Ann are awaiting EDA funding. A portion of this would be used to rehabilitate support facilities surrounding the Gloucester State Fish Pier and some of the funding is targeted specifically to the issue of marketing underutilized species found on the Georges Bank.

Another example of the program's versatility can be seen in Gloucester, which recently received a Title IX grant. The Gloucester project will not only provide needed pier renovations and improvements, but also construction of a freezer/cold storage, fish processing stalls, a fish conveying system, gear storage facility, and ancillary and supportive buildings, along with a sewage pretreatment plant. In addition to these onshore facilities, part of the EDA money will be used to fund a revolving loan program to provide capital for purchase of vessels, gear, and related equipment.

The Economic Development Administration Office serving the New England States is in Philadelphia. The address is:

Suite 10424 Building 600
Arch Street
Philadelphia, Pennsylvania 19106

XIII.B.3 Small Business Administration (SBA)

Three types of financial aid are available to the Massachusetts fishing industry through the SBA under three different programs: 1) direct loans and up to 90% guaranteed loans through the "Section 7 (a)" program, (15 USC S. 636 (a)); 2) "Section 502" on Local Community Development Loans and guarantees (15 USC S. 696); and, 3) Disaster and Economic Injury Loans and guarantees (15 USC S. 636 (b)).

"Section 7 (a)" Loans

The "7(a)" program provides for direct loans of up to 2/3 of the venture cost with 1/3 equity required of the applicant. Although SBA, by agreement, will not accept applicants that are otherwise eligible for NMFS funding, they will pick up vessel funding for ships under 5 tons, small (under 250 employees, less than $9.5 million annual sale, and not dominant in market) on-shore facilities, and funding of front end or working capital.

Local Development Companies of "Section 502" Loans (LDC)

"Section 502s" Local Community Development programs (LDC) are corporations organized for the purpose of promoting economic development through projects which are initiated and then controlled at the local level. Gloucester, New Bedford, Fairhaven, Hingham, and Ipswich presently have LDC's operating successfully in their areas. Under the

direct loan program, 30% of the funding must come from local institutions, 60% form SBA and the remaining 10% from the LDC. The LDC program also provides for 90% of a loan incurred by eligible small business. Eligibility is established under SBA guidelines.

Disaster and Emergency Loan Program

The SBA administers a program of Disaster and Economic Injury Loans by providing direct loans of up to $500,000 at 6-5/8% for economic injury or 3-5% for disaster, with a three-year payment deferral period. The program is available for continuation or re-establishment of a business which has suffered substantial economic injury.

Enquiries may be made to:

Small Business Administration
150 Causeway Street
Boston, Massachusetts 02114

XIII.B.4 Farmers Home Administration (FmHA)

FMHA Guaranteed Business and Industrial Loans (7 USC S. 1989)

Providing guarantees of loans (up to 90% of principal and interest) to all types of business and industries in rural areas, and direct loans to public bodies, the FmHA could provide substantial aid to the fishing industry.

The FmHA will guarantee loans by private lenders to qualifying applicants (7 CFR S. 1980-E) and will indemnify up to 90% of the lendor's loss. FmHA advises potential borrowers who want loans of $350,000 or less to apply to the SBA.

Maximum maturities for business and industrial loans may be up to 30 years on land, building and permanent fixtures; up to 15 years on machinery and equipment and up to 7 years on working capital. The interest rates are determined by the market rate except in instances where public entities borrow for the purpose of providing community facilities, in which case the interest rate is set at 5%. Normally, FmHA requires at least 10% equity, but this is somewhat dependent on the circumstances of the loan.

Initial enquiries should be made to:

Farmers Home Administration
U.S. Department of Agriculture
Washington, D.C. 20250

XIII.B.5 Farm Credit System

Production Credit Association Loans
(Farm Credit Act of 1971. LP 92-81)

The farm Credit System is a federally chartered cooperative banking system owned and controlled by its borrowers. The Farm Credit Administration, an independent federal agency, supervises the system. Fishermen who borrow are required to purchase some stock in the system to assist in capitalization. In order to obtain funds for loans, the system sells notes, bonds, debentures on money markets, lends money from its own stock, and borrows funds for re-lending. Short term and intermediate loans are made regionally through local production credit associations (PCA).

Maximum loan coverage of up to 75% of value is allowed over a maximum period of 7 years with interest rates commensurate with the cost of the underlying bond issue.

The Southeastern New England Production Credit Association has been a major lender to fishermen in Massachusetts, and in the past few years 300-400 loans have been made primarily for purchasing, refinancing, and outfitting vessels.

This program is most appropriate for smaller loans as the repayment terms are extremely short (7 years); however, it does appear that these loans have been used many times by fishermen for such activities. The program can also be utilized to obtain short-term working

capital (again repayment of 7 years). This is particularly helpful to fishermen, as many of the other programs already identified did not allow for the financing of working capital.

Banks for Cooperatives (Farmer Credit Act PL 92-81)

The banks for cooperatives will make loans to meet any credit need which will enable an eligible cooperative to perform its marketing, supply, or business service functions. Such activities may include construction, remodeling, or expansion of facilities; and the purchase of land, buildings, equipment, vessels, or ship supplies. The program can also be used to secure working capital.

The terms of the loans are flexible and tailored to the specific needs of the borrowers. Repayment schedules range from 15 years at 7¼ - 8¼% to 18 months at 6¼ - 7½%. There is considerable disagreement among those who are familiar with this program as to whether vessel financing is included within its scope. According to the program's description, it could be, but in practice it is not.

The location of the bank serving the New England States is:

Springfield Bank for Cooperatives
P.O. Box 141
Springfield, Massachusetts 01101

XIII.B.6 Department of Housing and Urban Development (HUD)

Community Development Block Grants (CDBG) (4 USC 3535 (D))

The objective of this program is to support activities that expand opportunities for low and moderate income people by improving the community's public service facilities. Of particular concern are employment opportunities for persons residing within the recipient community.

Although this program is now funded and operating, its utility for the fishing industry would appear to be limited to the financing of on-shore facilities.

XIII.B.7 Regional Programs

New England Regional Commission (NERCOM)

NERCOM has recently participated in a highly successful revolving loan program administered under the aegis of the Cape Ann Commerical Fishermans Fund. After only a short period of operation, the Fund successfully arranged two good sized loans and had numerous other applications awaiting determination.

Recommendation

NERCOM might well be able to expand this promising opportunity to other areas of concern and perhaps could pay an instrumental role in promoting a demonstration project relating specifically to the formation of fishing cooperatives. One possible source of funding for such a venture may be the "National Sea Grant Program" 33 USC Sec. 1121 et seq. under the "Sea Grant Improvement Act of 1976" P.L. 94-461, Oct 8, 1976, which provides:

> "The objective of this title is to increase the understanding, assessment, development, utilization and conservation of the nations' ocean and coastal resources by providing assistance to promote a strong educational base, responsive research and training activities, and broad and prompt dissemination of knowledge and techniques".
> P.L. 94-461 Sec. 202 (b)

The New England Regional Commission Office
55 Court Street
Boston, Massachusetts 02108

XIII.B.8 State Programs

Massachusetts Industrial Mortgage Insurance Agency (MIMIA)

Under the authority granted in MGL Ch. 23A, Secs. 29-35 the MIMIA may insure loans for the acquisition, construction, or alteration of industrial development facilities (not including vessels).

The MIMIA is the only state loan guarantee program presently available. It is not limited to assisting the fishing industry, but it could be heavily used by this industry. Funding is limited and in great demand for a variety of industrial needs. For this reason, only aggressive action on the part of the fishing industry will ensure that a substantial portion of the available funding is directed to its concern.

Massachusetts Business Development Corporation (MBDC)

Established by a special act of the 1953 Massachusetts Legislature (Ch. 673), the MBDC is a private corporation under special charter by the Massachusetts banking community. MBDC makes loans to any private, profit making firm which is Massachusetts based and contributing to expansion of employment to firms which have first been refused by conventional lenders.

Attachment C: Fishing Cooperatives Bibliography

Bailey, John M. Fishery Cooperative Operations. (FCS Research Report 30). Washington D.C.: United States Department of Agriculture. Farmer Cooperative Service, 1975.

Hill, A.V. Tides of Change: A Story of Fishermen's Co-operatives in British Columbia. Vancouver, B.C.: Prince Rupert Fishermen's Co-operative Association, 1967.

McMullin, Leslie D. Organizing and Operating Fishery Cooperatives in the United States. (Circular 155) Washington D.C.: United States Department of the Interior. Fish and Wildlife Service, Bureau of Commercial Fisheries, 1963.

Marcus, Henry S.; Townley, James R.; Brown, Alan J; and Eddie, Lee. Using Co-operatives to Aid the New England Fishing Industry. (Report No. MIT SG 75-7). Cambridge, Massachusetts: Massachusetts Institute of Technology Sea Grant Program, 1974.

Napoli, James J. Fisheries Cooperatives: Their Formation and Operation- (Marine Memorandum 30) Narrangansett, R.I.: University of Rhode Island, Marine Advisory Service, 1972.

Oregon State University Extension Service. Sea Grant Marine Advisory Program. Proceedings, Fisheries Cooperative Symposium at University of Washington, Seattle. February 6-7, 1975. Corvallis, Oregon: August 1976

Prochaska, Fred J. The Fisherman and the Farm Credit System. (Florida Sea Grant Publication SUSF-SG-73-004). University of Florida Cooperative Extension Service, Marine Advisory Program, 1972.

Sea Source: A Catalog of Publications from Sea Grant Institutions, 1976. Compiled by the Washington Sea Grant Communications Program at the University of Washington in association with Sea Grant Colleges and Universities throughout the country. (National Oceanic and Atmospheric Administration Grant No. 04-5-158-15).

Smith, Frederick J. Organizing and Operating a Fishery Cooperative, Part 1. Corvallis, Oregon: Oregon State University Marine Advisory Program, 1972.

CHAPTER XIV: ZONING FOR A HARBOR AREA

XIV. 1 Introduction

Zoning is the principal tool communities have for implementing planning and land use policies. Many new zoning techniques have been devised to deal with land use problems of special areas such as central business districts, historic areas, harbor areas, etc.

Present day harbor areas suffer from decades of neglect and loss of vitality. Many of the original functions such as water-borne transport of raw materials and finished goods, construction and repair of ships, commercial fishing, etc., have either completely disappeared or have declined in volume and scope. With the disappearance or reduction of these basic functions of harbors, other industries and businesses that depended on them no longer have any reason for existence. These include storage areas and warehouses, ship chandlers, export-import businesses, sailors' houses and lodging houses, and a host of other industries and activities that catered to a vitally functioning harbor. Many of the structures in which these activities were carried out have been either completely abandoned or at best underutilized for years and show the results of decay and disrepair. Some of the warehouses and other such structures have been converted to other uses -- mostly industrial uses. Some businesses have continued to function to the present day although they no longer have any compelling reason to be located in the harbor area. Such activities include businesses dealing in wholesale lumber, coal, oil, machine oil and bodyshops, etc.

The problem of revitalizing harbor areas is therefore manyfold. Abandoned buildings and structures must be either

repaired and rehabilitated or demolished. Other land uses not dependent on harbor area location but occupying valuable harbor frontage must be relocated; businesses and activities that benefit from or are completely dependent on harbor-front location must be brought into the area, and supportive businesses and functions such as hotels, motels, lodging houses, restaurants, marinas, marine supplies, banking and insurance, etc., must be encouraged. In addition, it is a most valuable natural resource and an environmentally critical area which must be preserved and protected and utilized for public benefit. As tourism forms an increasingly important element in harbor area and downtown revitalization, facilities and amenities such as adequate and conveniently-located parking, pedestrian paths and plazas, sea-front accesses, sitting and viewing areas, miniparks and roadside planting, etc., have to be provided.

Control and development of harbor areas may be accomplished in a variety of ways. Some of these include redevelopment programs (urban renewal), public easement purchase, property tax concessions, outright acquisition and zoning.

With the passage of Chapter 808 of the Acts of 1975 which amended M.G.L., Chapter 40A, The Zoning Act, communities have been given a wide latitude within which to adopt innovative zoning techniques. This chapter deals with zoning as a land use management technique for harbor areas.

XIV. 2 Establishing a Harbor Zoning District

2.1 Zoning Map - Chapter 808

The new zoning act mandates that all districts into which a city or town is divided must be shown on a zoning map. Each district would allow or prohibit specific uses and would have uniform regulations within the district. One of the best ways to control land use in a small harbor area is to create a special harbor district.

2.2 Zoning District Boundaries

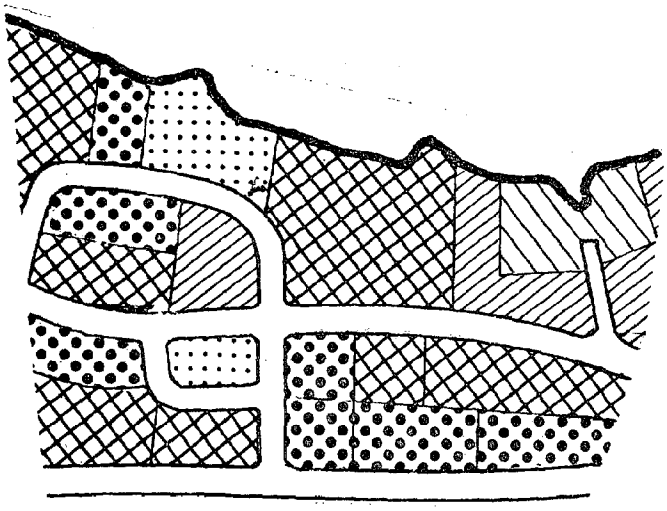
The easiest and most practical method of establishing zoning district boundaries is to follow existing survey lines. These survey lines usually establish street and alley center lines, property lines, railroad and utility lines and right-of-way lines. In addition natural features such as streams and ridges may be appropriate in establishing district boundaries. (Figure XIV. 2.1)

An existing land use plan may be adequate for roughing out zoning district boundaries, but is usually too generalized for direct transfer. A final boundary line check should be made in the field.

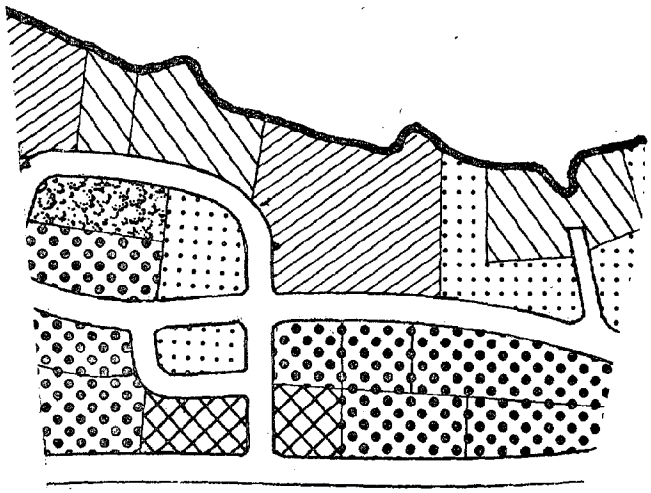
2.3 Uses Within Harbor Zoning Districts

Within the harbor district the most desirable uses would be those that relate to and are dependent upon the waterfront. These uses include a major transportation artery that services the harbor area, marine construction, repair and supply establishments, water-oriented recreational facilities, commercial fishery uses, etc. Open space and vacant land for future expansion should also be considered for inclusion within the proposed harbor district.

FIGURE XIV.2.1 HOW TO ESTABLISH THE HARBOR ZONING DISTRICT



EXISTING LAND USE PLAN (1978)



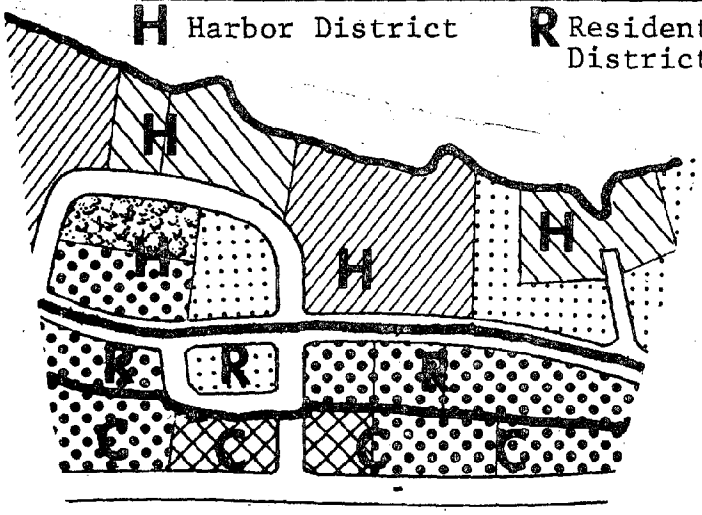
PROPOSED LAND USE PLAN (2000)

LEGEND

- Recreation/Commercial
- Commercial
- Recreation/Open Space
- Public
- Fishing
- Residential

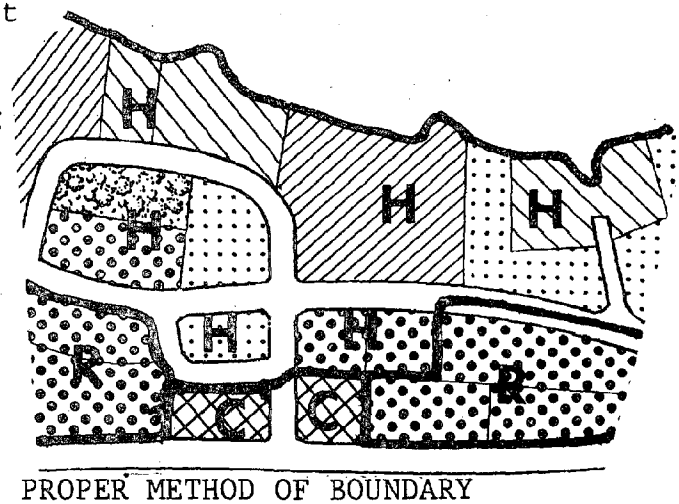
ZONING BOUNDARY IS ESTABLISHED OVER PROPOSED LAND USE PLAN

H Harbor District R Residential District C Commercial District



IMPROPER METHOD OF BOUNDARY SELECTION

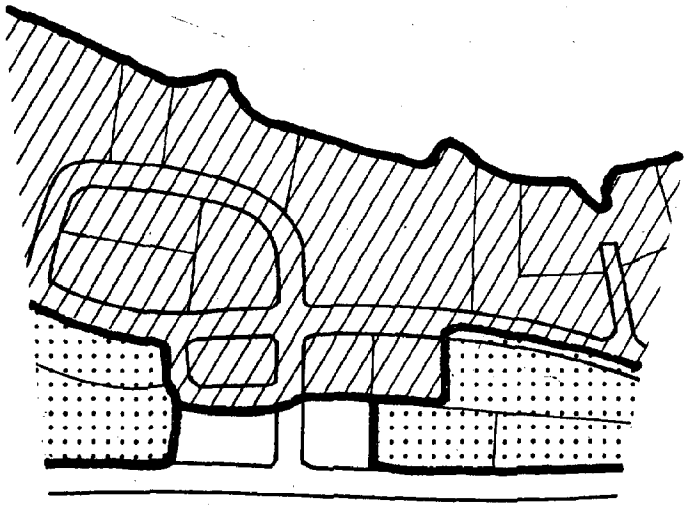
- Streets are strictly used as boundary line.
- Strip zoning with several nonconforming uses.
- No consideration given to relating uses.



PROPER METHOD OF BOUNDARY SELECTION

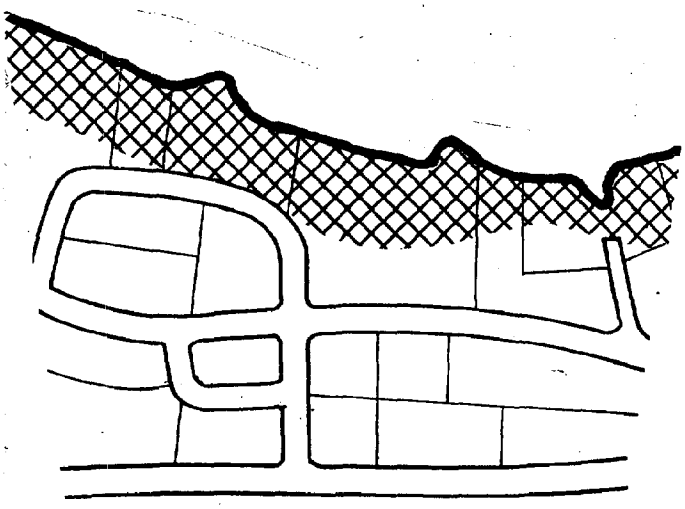
- Similar uses on both sides of street are included in district.
- Few nonconforming uses.
- Lot size relates to density regulations of district e.g. small lots go into higher density district.

FIGURE XIV. 2.2 HOW TO ESTABLISH THE WETLAND/FLOODPLAIN DISTRICT

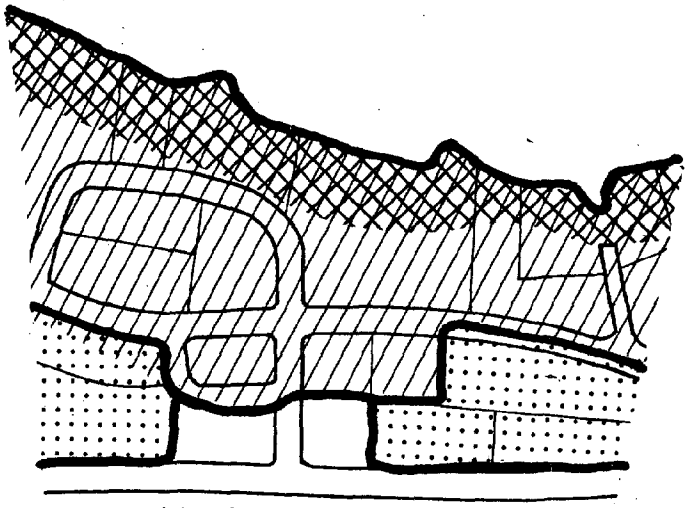


Harbor District Residential District Commercial District

EXISTING ZONING MAP



WETLAND/FLOODPLAIN DISTRICT MAP BASED ON H.U.D. FLOOD HAZARD INSURANCE MAP



WETLAND/FLOODPLAIN DISTRICT MAP OVERLAYED ON EXISTING ZONING MAP

The entire shore-front of a community need not be included within the harbor district, but rather it should be a well-defined compact area which includes all those uses which are relevant to the functioning of a harbor.

XIV. 2.4 Wetland/Floodplain Overlay District

The community may also want to consider wetlands and floodplain protection within the harbor zoning district.

With the establishment of the H.U.D. flood insurance program, many participating communities have been provided with flood hazard insurance maps delineating wetlands and floodplain areas. These areas may be useful for forming a wetland/floodplain district. The H.U.D. wetland and floodplain map may be used as an overlay on the map of the entire community which includes the harbor zoning district.

H.U.D. regulations should be followed in setting out the specific and general provisions of the wetland/floodplain district. Objectives, dimensional regulations, allowed and special permit uses, etc., should be provided within the zoning by-law or ordinance. The requirements of the wetland/floodplain district will prevail over the provisions of the underlying district (in this case, the harbor zoning district). (Figure XIV. 2.2)

XIV. 3 Purposes of a Small Harbor District

3.1 Purposes from Chapter 808

A zoning ordinance or by-law should state the purposes for each zoning district which is established.

Chapter 808 states several purposes are related to land use management of a small harbor area. These include:

" - to secure safety from flood;
- to facilitate adequate provision of water, open space and other public requirements;
- to conserve the value of land including conservation of natural resources and the prevention of blight and pollution of the environment;
- to encourage the most appropriate use of land; and
- to preserve and increase amenities."[1]

3.2 Type of Regulations from Chapter 808

Chapter 808 also sets out a list of regulations which might be included:

"Regulations may include but are not limited to restricting, prohibiting, permitting or regulating:

a) uses of land, including wetlands and lands deemed subject to seasonal or periodic flooding;
b) size, height, bulk, location and use of structures, including buildings . . .;
c) use of bodies of water including water courses;
d) noxious uses;
e) areas and dimensions of land and bodies of water to be occupied or unoccupied by uses and structures, courts, yards and open spaces;

---

[1] Chapter 808, Section 2A, 1975.

f) density of population and intensity of use;

g) accessory facilities and uses, such as vehicle parking and loading, landscaping and open space; and

h) the development of natural, scenic, and aesthetic qualities of the community."[1]

XIV. 3.3 Purposes for a Harbor Area

Chapter 808 gives the community some broad guidelines to consider. However, these should be translated into specific purposes and objectives.

One of the major purposes for regulating land use in a harbor area would be to maximize the use of a scarce resource by allowing compact development along with specific amenities, such as pedestrian links, high standards of site planning and architectural design, and preservation of views and open space. This would result in environmentally-sound development while preserving the quality of life.

Another objective would be to encourage the development of marine and harbor related land uses in order to take advantage of the peculiar characteristics of the waterfront.

A final objective, and probably the most important, would be to foster economic development. This objective would have a two-prong result in that a central business area could be revitalized if the harbor uses attracted people and provided pedestrian-oriented activities. Also, establishment of year-round uses within the harbor district would give added vitality to the area.

---

1 Chapter 808, Section 2A, 1975.

XIV. 4 Regulatory Considerations and Land Uses in a Harbor District

4.1 Typical Regulations

Regulations for zoning districts usually pertain to dimensional requirements and uses. Typical regulations would include minimum lot size and frontage, depth, setback requirements, front, rear and sideyard dimensions, maximum lot coverage, maximum floor area ratio, maximum height and parking requirements.

The Zoning Act requires that regulations be uniform within a district for each class of use. The regulations for a harbor zoning district should be such that they encourage compact development. To encourage desired land uses in a harbor district, a community may allow smaller minimum lot sizes, narrower and less stringent minimum frontage setback and depth requirements, greater lot coverage and higher floor area ratios. These may work as incentives for certain uses to locate in the harbor district.

4.2 Typical Uses

Alternatively, a community may prohibit from other zoning districts most of the uses that are desirable for the harbor district, and allow such uses as a matter of right or by special permit with bonus incentives. Table XIV. 4.1 is a typical use table and includes a wide variety of uses. Many of these uses may not be applicable to the intent of any one specific harbor district, but certainly those included under conservation, preservation, fisheries, and recreational would be appropriate.

Table XIV. 4.1 is broken down into allowed uses, special permit uses, and uses which are not allowed. As mentioned previously, the decision about specific uses and how they will be regulated is up to the community.

The use table should only be used as a guide. Under the categories of A - allowed, S.P. - special permit, N.A. - not allowed, the numbers 1, 2, 3 appear. The numbers are a recommended preference guide for regulation. Number 1 means that it would be the first choice; number 2, second choice; and number 3, third choice. For example, under A. agricultural, number 3, parcels of less than five acres, regulation by special permit would be most desirable while the second option would be to allow this use as a matter of right.

Where a number 1 exists alone, there is either no other choice or a second or third option would be undesirable.

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
A. Agricultural [1]			
1. Accessory Structures	1		
2. Acquaculture	1		
3. Agriculture, horticulture, floriculture (parcels of less than 5 acres)	2	1	
4. Agriculture, horticulture, floriculture (parcels of more than 5 acres)	1		
5. Commercial forestry	1		
6. Commercial stables/kennels		2	1
7. Commercial sale of products raised on premises	2	1	
8. Farmstand	2	1	
9. Greenhouse	2	1	
10. Nurseries/tree farm	1	2	
11. Piggeries			1
12. Raising/keeping of fur-bearing animals			1

1 The Zoning Act specifies that a zoning ordinance or by-law may not prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of agriculture, horticulture or floriculture. However, it is suggested that a special permit be required for some of the uses in this section of the table based on previous decisions of the Massachusetts Supreme Judicial Court regarding what constitutes agriculture. Agricultural activities may be limited to parcels of more than five acres within a harbor zoning district.

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
13. Raising/keeping of livestock	1		
14. Storage of agriculture products raised on premises	1		
B. Business			
1. Bank		2(b)	1
2. Boarding House		1	
3. Craft Shops	2	1(b)	
4. Funeral Home			1
5. Guest House		1	
6. Hairdressers/ Barbers		2(b)	1
7. Hotels and Motels		1(b)	
8. Laundry			1
9. Medical Clinic		2(b)	1
10. Night Club		1(b)	
11. Parking Lot		1(b)	
12. Parking Garage		1(b)	
13. Printing			1
14. Professional Office		2(b)	1
15. Real Estate Office			1
16. Restaurant (drive-in)		2(b)	1
17. Restaurant (inside)		1(b)	

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
18. Restaurant (outside)		1(b)	
19. Room rentals		1	
20. Specialty shops: art galleries, gift shops, antiques, import leather, and natural goods	2	1(b)	
C. Commercial			
1. Auto			
a. Gas			1
b. Repair			1
c. Sales-Rentals			1
d. Service			1
2. Bait Shops	2	1	
3. Boating			
a. Gas		1(b)	
b. Repair		1(b)	
c. Sales-Rentals		1(b)	
d. Service		1(b)	
4. Car Wash			1
5. Commercial Fishing	1	2	
6. Commercial Sight-seeing or Ferrying		1(b)	
7. General Commercial (retail)		2(b)	1

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
8. General Commercial (wholesale)		2(b)	1
9. Marinas		1(b)	
10. Marine Supply Outlet	2	1(b)	
11. Seafood, wholesale or retail outlet	2	1(b)	
12. Testing of Marine Equipment and Instruments		1(b)	
13. Uses dependent on the Waterfront		1(b)	
14. Uses not dependent on the Waterfront			1
D. Conservation/ Preservation			
1. Conservation	1		
2. Cultural, visual, scenic preservation	1		
3. Historical Preservation		1(b)	
4. Wildlife Habitat	1		

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
E. Educational-Religious[1]			
1. Church owned by sect or Denomination	2	1	
2. Instruction in Boating, Water Sports	1	2	
3. Private School (non-profit)	2	1	
4. Private School (profit)		2	1
5. Public School	2	1	
6. Research Lab.		1(b)	
F. Fisheries			
1. Accessory Structures	2	1(b)	
2. Fin Fishing	1	2(b)	
3. Opening Shellfish	2	1(b)	
4. Shell Fishing	1	2(b)	
G. Industrial			
1. Airports-heliports			1

[1] The Zoning Act specifies that a zoning ordinance or by-law may not prohibit, regulate, or restrict the use of land or structures for certain religious and educational purposes. A special permit could be required as long as it is subject only to reasonable regulations.

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
2. Energy (electric nuclear generation plant			1
3. Gas			1
4. Gravel			1
5. Light Industry			1
6. Mining			1
7. Oil Refinery			1
8. Public Utilities: telephone, telegraph, T.V., Radio			
a. Underground		1	2
b. Above Ground			1
9. Quarrying			1
10. Sand			1
11. Storage Tanks: oil,gas			1
12. Temporary Construction Office		1	
13. Transmission Lines and Towers			1
14. Shipping		1(b)	2
15. Uses dependent on the Waterfront		1(b)	2
16. Uses not dependent on the Waterfront			1

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
H. Manufacturing			
1. Canneries			1
2. Lumber Products			1
3. Marine Railways		1(b)	2
4. Repair Yards			1
5. Rope			1
6. Storage Yards			1
7. Truck Terminals			1
8. Warehouse			1
9. Uses dependent on the Waterfront		1(b)	2
10. Uses not dependent on the Waterfront			1
I. Municipal			
1. Aquarium		1(b)	
2. Band Shell		1(b)	
3. Civic Center		1(b)	
4. Community Center		1(b)	
5. Library		2(b)	1
6. Municipal Buildings		2(b)	1
7. Museum and Exhibits		1(b)	
8. Outdoor Pavillion		1(b)	
9. Playhouse		1(b)	

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
10. Pumping Station		2(b)	1
11. Theatre		1(b)	
12. Water Works		2(b)	1
J. Public			
1. Billboards			1
2. Dams		1	
3. Dredging		1(b)	
4. Flood Drainage		2	1
5. Hospital			1
6. Nursing Home		2(b)	1
7. Passenger Station: bus, transit, train		1(b)	
8. Refuse dumping			1
9. Sanitary Landfill			1
10. Sewage Disposal			1
11. Shore Bulkhead and Seawalls		1	
12. Shore Rip Rap and Revetments		1	
13. Signs, other than Billboards		1(b)	
14. Temporary Structures and Use		1(b)	2
15. Veterinary Hospital			1

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
K. Recreation-Amusements			
1. Boathouses and Wharves	2	1(b)	
2. Boating	1		
3. Campgrounds		1(b)	2
4. Cemetery	1		
5. Day Camp		1(b)	2
6. Footbridges, Fences		1(b)	
7. Golf Course		1(b)	2
8. National Tourist Attraction-Theme Park		1(b)	
9. Bowling Alley			1
10. Nature Study	1		
11. Non-Profit Recreational Facility		1(b)	
12. Observation Deck or Shelter	1	2(b)	
13. Outdoor Amusements		2(b)	1
14. Parks, Playgrounds	2	1	
15. Picnicking	2	1	
16. Piers, Docks, Floats and Landings	2	1(b)	

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
17. Private Clubs (Non-Profit)		1(b)	
18. Private Clubs (Profit)		1(b)	
19. Swimming	1		
20. Tennis Courts	1	2	
21. Trails, Walks, Paths, Cat Walks, Duck-blinds	1	2(b)	
22. Yacht Club		1	
23. Trapping/ Hunting		2	1
L. Residential			
1. Cluster		1(b)	2
2. Conversions Single to Two-Family		1(b)	
3. Elderly Housing		1(b)	
4. Home Occupations		1(b)	
5. Low and Moderate Income Housing[1]		1(b)	

[1] If the quotas specified in M.G.L., Chapter 40B are not met by the community, low- and moderate-income housing must be allowed in most cases.

TABLE XIV 4.1 Recommended Use Table for a Harbor Zoning District (continued)

Uses	A. Allowed	S.P. Special Permit	N.A. Not Allowed
6. Mobile Homes			1
7. Multi-Family		1(b)	2
8. P.U.D.		1(b)	2
9. Seasonal Dwellings	2	1(b)	
10. Single-Family	1		
11. Two-Family	2	1(b)	

XIV. 5 Dealing with a Nonconforming Use, Building or Structure

5.1 Definition

Small harbor areas usually contain nonconforming land uses, buildings and structures. These were established at a time when they were directly dependent on a harbor front location, and were not constrained by any zoning regulations. However, they do not conform to existing zoning regulations and are therefore considered nonconforming.

By a court decision, it has been established that a preexisting use, building or structure may not be prohibited by a zoning ordinance or by-law.[1] The state zoning act also prohibits total abolition of nonconforming uses and structures.

Nonconforming uses, buildings and structures may be dealt with in several ways.

5.2 Abandoned or Not Used Uses, Buildings and Structures

Communities may establish zoning provisions which stipulate that nonconforming uses, buildings or structures that have been abandoned or not used for a period of two years or more would no longer be lawfully in existence. Any new use or structure would have to comply with the zoning currently in effect.

Abandonment is very difficult to prove, however, as there must be an intent to abandon. That is, there must be an action which carries out the abandonment. One

---

[1] Opinion of the Justices, 234 Mass. 597, 606, 127 NE 525.

example is a supreme judicial court case where the court decided that because the owner of the nonconforming use entered the service for two years, there was no intent to abandon.[1] The term "not used for two years or more" is easier to prove and should be defined in the zoning ordinance or by-law. Basically, "not used" could be defined in terms of a building or structure being unoccupied for two years or more or a use not exercised for two years or more. Once a community has determined that a use, building or structure has not been used for two years or more, they are still faced with the problem of how to get rid of any physical structures which could remain standing and empty for years. Demolition of such structures may not be regulated under zoning but is rather the responsibility of the building inspector or commissioner in administration of the State Building Code which allows regulation of any structures that have become hazardous. The building inspector or commissioner could require demolition when it is felt that a hazard exists when the structure is allowed to remain standing.

XIV. 5.3 Alteration, Extension, or Change to A Nonconforming Use, Building or Structure

A second method which can be used by a community to regulate pre-existing nonconforming structures or uses is also found within Section 6 of the new zoning act. The statute allows extension, alteration or change to such uses if a special permit is granted. In order to grant the special permit, a finding must be made that such change, extension or alteration is not substantially more detrimental than the existing nonconforming use is to the neighborhood.

---

1 Morin v. Board of Appeals of Leominister (1967) 227 N.E. 2d 466, 352 Mass. 620.

A community may want to define "substantially more detrimental" in general terms in their zoning ordinance or by-law. In past supreme judicial court cases, the court pointed out a three-part test which should be used in such considerations. This test may be useful in defining "substantially more detrimental." Basically, the three part test would involve the following:

a. Does the use reflect the nature and purpose of the use which was allowed when the zoning by-law or ordinance took effect?

In McAleer v. Board of Appeals of Barnstable, 361 Mass. 317, the Supreme Judicial Court felt that a lawful nonconforming use, that of an inn operator in the summer could be converted to a year-round use without derogating from the purpose of the zoning in effect when the inn was originally established. The by-law originally allowed an inn for summer use, and the court felt that a change to year-round use did not change the nature of the use.

b. Is there a difference in quality or character?

In Marblehead v. Rosenthal, 316 Mass. 124, the Supreme Judicial Court felt that a small tailor and furrier operation in one store with some hand-cleaning of clothes was different from operation of three stores with complete mechanical equipment for dry cleaning. In Brady v. Board of Appeals of Westport, 348 Mass. 515, the Supreme Judicial Court felt that a preexisting moor with a twelve foot pier for four or five boats was different in character from a structure consisting of two piers, one 80 feet long and the other 90 feet long.

c. Does the current use have a harmful or noxious effect on the neighborhood?

In other words, would the change, alteration, or extension of the nonconforming use or structure have a bad effect on the neighborhood. This should be determined on a case-by-case basis, but might be regulated in terms of additional traffic hazards created by the change or such things as increased odors, dust, or noise.

XIV. 5.4 Bonus Provisions to Control Nonconforming Uses, Building or Structures

A community should establish bonus provisions such as density in excess of that allowed for any uses or structures which conform to the objectives of the harbor district. Such bonus zoning would be handled by a special permit pursuant to the provisions of Section 9 of the new zoning act. Providing generous bonus provisions for conforming uses may encourage an owner to change a nonconforming use to a conforming use mainly for economic benefits. Indirect pressure to conform, such as a harbor businessmen's organization or through marketing efforts of a chamber of commerce, which point out the positive aspects, might bolster a community's efforts. Further discussion of bonus zoning will be found in the next section, Special Permits.

XIV. 6 Regulating the Use of Land in a Small Harbor by Special Permit

6.1 Definition

The special permit process is probably the most effective regulatory technique allowed under zoning. Through this process, a community may review proposed uses, buildings, and structures for compliance with the objectives of the harbor zoning district. The community actually "bargains" with the developer to obtain the best development package.

The beneficial results from using this technique for small harbor development are many. The most significant would be the protection of the environmental integrity and sensitive character of the small harbor while ensuring revitalization.

XIV. 6.2 Special Permit Granting Authority

A special permit is granted by the "special permit granting authority." The new zoning act defines "special permit granting authority" as follows:

> "special permit granting authority," shall include the board of selectmen, city council, board of appeals, planning board, or zoning administrator as designated by zoning ordinance or by-law for the issuance of special permits.

This means that the zoning ordinance or by-law must include a provision which designates one of the above municipal agencies to issue special permits. No one else may be considered as the special permit granting authority. However, a community may have more than one special permit granting authority. Each special permit granting authority must be designated to issue a certain class or kind of special permit.

For example, the planning board may be designated to issue special permits for any use which would require site plan review. The board of appeals could issue all other classes of special permits. The board of appeals could also grant the power to issue special permits for uses which directly affect waterfront development to a zoning administrator who could be the community and harbor development authority director. However, many communities should be aware that the zoning administrator has a very limited time period in which to act and therefore this alternative may not be feasible.

XIV. 6.3 Granting a Special Permit

In order to grant a special permit, the special permit granting authority must follow the procedures of the new zoning act. Figure XIV. 6.1 is a flow chart of these procedures based on the specific group responsible for issuing special permits.

6.4 Findings

The special permit granting authority may only issue a special permit after a finding that the use is in harmony with the general purpose and intent of the zoning ordinance or by-law. In other words, the proposed use meets the objectives and purposes which were established for the harbor zoning district. The special permit granting authority must also make a finding that the general or specific provisions of the zoning ordinance or by-law regarding special permit uses are met. Provisions might include density standards, parking requirements, set-backs, or general conditions, for example, that the use would revitalize the harbor area, that the use is dependent upon water, that the use is of a marine or tourist orientation, or that the use supports the commercial fishery or recreational industry.

6.5 Classes of Special Permits

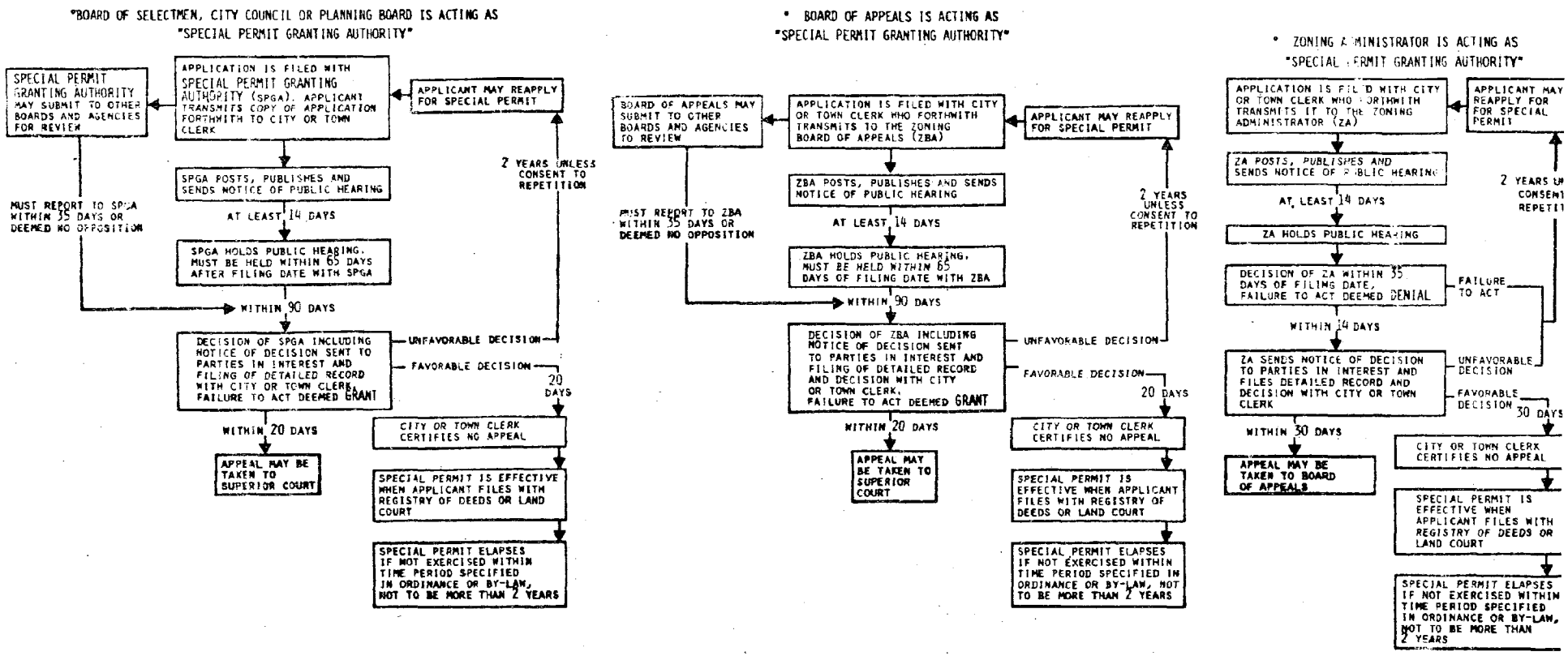
The type of special permits which may be granted are varied. Zoning ordinances or by-laws may authorize special permits for such uses as a) multi-family; b) cluster; c) planned unit development; and d) bonus zoning.

Each of these types of special permits may warrant consideration within a harbor zoning district.

FIGURE XIV 6.1

SPECIAL PERMIT PROCESS (CONSULT G.L., CHAPTER 40A FOR COMPLETE AND BINDING TEXT)

* SPECIAL PERMIT GRANTING AUTHORITY MAY BE CITY COUNCIL, BOARD OF APPEALS, PLANNING BOARD, OR ZONING ADMINISTRATOR AS DESIGNATED IN ZONING ORDINANCE OR BY-LAW. CERTAIN CLASSES OF SPECIAL PERMITS MAY BE ISSUED BY ONE OF THE PARTIES, AND OTHER CLASSES BY ANOTHER.



a. Multi-family uses would support the harbor and would allow compact development as well as provision of open space and preservation of significant views.

b. Cluster development if residential would have beneficial results similar to multi-family uses. However, other uses such as marine complex including a hotel, marina, restaurant, etc., could be clustered into a pleasing and complimentary development.

c. Planned unit development - Unless a harbor zoning district is quite sizeable, a planned unit development may not be as feasible as multi-family or cluster development. However, in terms of economic revitalization, a planned unit development approach may be very advantageous.

A community could prepare its harbor development plan to resemble a large-scale planned unit development. Through various incentives such as bonus zoning, the community may be able to encourage developers to locate specific uses according to the harbor development plan. If the harbor zoning district is sufficiently large, more than one planned unit development might be feasible.

d. Bonus zoning - Bonus or incentive zoning, which is authorized under Section 9 of The Zoning Act by special permit basically allows a community to trade development rights such as increases in the allowable density or intensity of use, in exchange for desirable amenities such as increased open space, pedestrian and transportation access, or siting. Without the bonus, the desired amenities would not be economically feasible to the developer.

The first and most important step in developing a bonus system is to develop specific objectives the community wants to accomplish by using bonuses: The intent of most bonus provisions could be categorized as follows:

a. improve pedestrian circulation;

b. improve access to transportation facilities;

c. increase light and air, including view protection and enhancement;

d. increase pedestrian and transportation amenities such as open space; and

e. increase construction and location of desirable uses in the area.

After the purposes of bonus zoning have been established, the next step is to determine the amenities and bonuses which will be exchanged. If bonus zoning is provided in a community, The Zoning Act requires that the zoning by-law or ordinance specifically list the improvements, amenities or locations of proposed uses that will be exchanged. The ordinance or by-law must also list the increases in allowable density or intensity of use. The community may wish to correlate the amenities to the purposes. The San Francisco Downtown Zoning Study[1] established the following:

Primary Public Purpose	Amenity
Accessibility	Rapid Transit Access Rapid Transit Proximity Parking Access
Pedestrian	Multiple Building Entrances Sidewalk Widening Shortening Walking Distance
Pedestrian Amenity	Plaza
Light and Air to Streets	A Side Setback Low Coverage on Upper Floors

[1] San Francisco Downtown Zoning Study, December, 1966. Department of City Planning, 100 Larkin Street, San Francisco, California 94102, pp. 22-23.

Primary Public Purpose	Amenity
View Protection and Enhancement	Low Coverage on Upper Floors Observation Decks

As for the bonuses, the most difficult step for the community is to establish the size of the bonus. A report by the American Society of Planning Officials entitled Bonus Provisions in Central City Areas[1] suggests the following:

The floor area bonus is usually calculated in one of four ways:

a. Adding a certain number of square feet of building area for each unit of feature provided, e.g., for each square foot of plaza, six square feet may be added to the total floor area.

b. Adding a certain number of points of floor area ratio for providing a specified feature, e.g., the floor area ratio may be increased by 1.5 for a lot characterizing a described amenity.

c. Adding a certain percentage to the floor area ratio for providing a specified feature, e.g., the floor area ratio may be increased by 15 percent for a lot abutting an open space of a designated size.

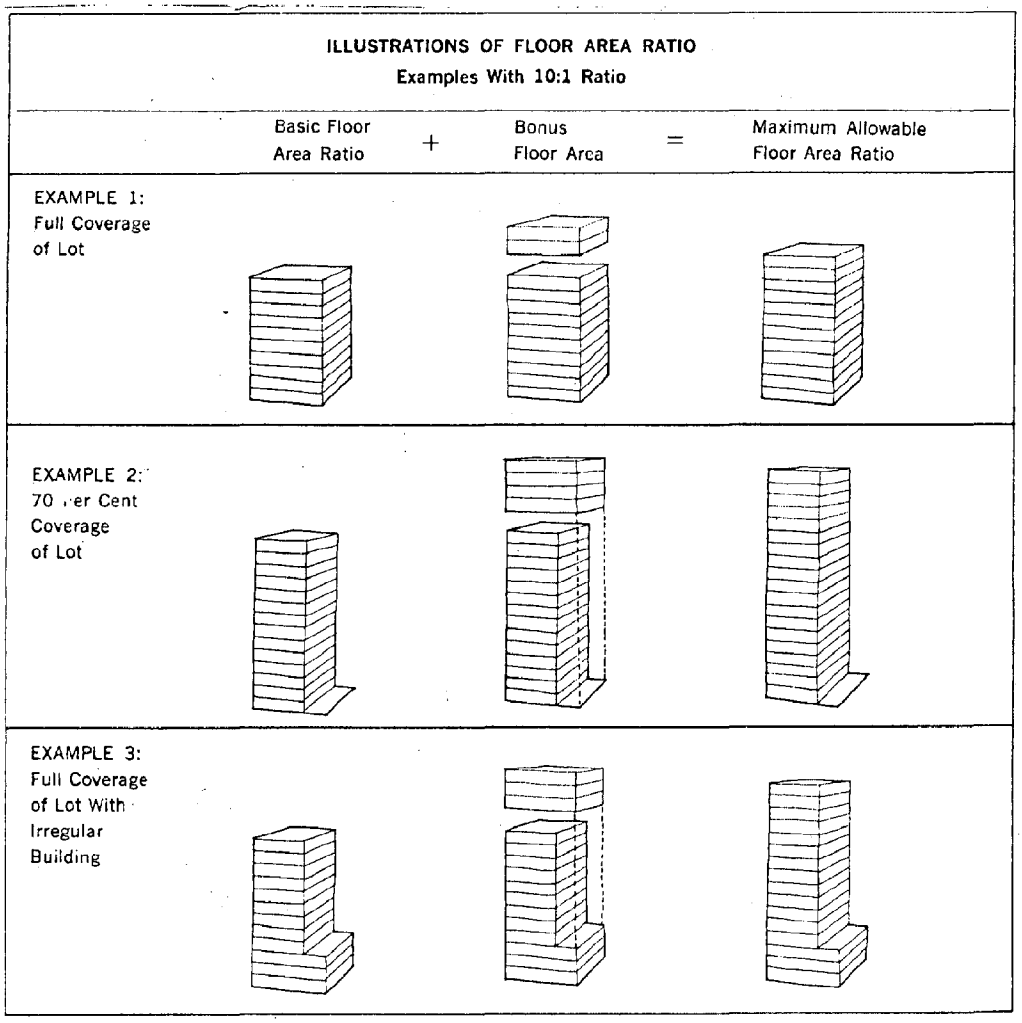
d. Increasing the size of the lot for purposes of computing the floor area ratio in proportion to the features provided, e.g., 50 feet shall be added to the depth of the lot for calculating the area of the lot for purposes of the floor area ratio if the lot abuts an open space of a designated size.[2]

---

1 Bonus Provisions in Central City Areas, Mary Brooks, American Society of Planning Officials' planning advisory reports, report no. 257, May 1970, pp. 11-13.

2 Peter S. Svirsky, "San Francisco: The Downtown Development System," The New Zoning, p. 144.

FIGURE XIV 6.5



From: The San Francisco Downtown Zoning Study, p. 18.

Other less common ways to calculate the bonuses are:

a. Increasing the height level by a certain number of feet for each unit of feature provided, e.g., for each foot of setback four additional feet may be added to the height.

b. Decrease the lot area by a percentage for providing a specified feature, e.g., for each two percent of lot area covered by an arcade, the lot area requirements shall be reduced by .6 percent.

c. Decrease the side yard requirements by a certain number of feet if the side yard abuts a street.

Table XIV. 6.1 suggests some examples of amenities and the bonuses that they might be traded for.

It is strongly recommended that a community consider special permits under bonus zoning for their harbor zoning district. Such provisions may provide the administrative tool necessary to direct development according to the harbor development plan.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING

1. PURPOSE: IMPROVED PEDESTRIAN CIRCULATION

Amenity	Bonus
A. MULTIPLE BUILDING ENTRANCES - Points of entry for pedestrians from a sidewalk into a building are increased to eliminate congestion created by one entry.	Increase in the maximum floor ratio or the percentage increase in the maximum lot coverage.
B. SIDEWALK WIDENING - The sidewalk is idened between the building to the property line by means of arcades, plazas, or increased building setback. The bonus would increase as the width of the sidewalk increased. An additional bonus would be given if the sidewalk or entry area is coordinated with adjacent entry areas.	Increase in the maximum floor area ratio and maximum height.
C. SHORTENED WALKING DISTANCE - The walking distance between uses is decreased and made safer by providing plazas, arcades, clustered siting of uses, or passageways. The bonus is given proportional to the amount the walking distance is decreased.	Decrease in the required setback requirements or percentage increase in the maximum lot coverage. Decrease in the required lot size and width and depth.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

2. PURPOSE: IMPROVED ACCESS TO TRANSPORTATION FACILITES

Amenity	Bonus
A. MASS TRANSIT ACCESS - Direct pedestrian access is provided from the building to a regional or community transit station. Access is constructed by the applicant or developer on private property. Access is open to the general public during normal business hours.	Percentage increase in the maximum lot coverage. Decrease in the required parking.
B. MASS TRANSIT PROXIMITY - The closer a building is sited to a regional or community transit station, the bigger the bonus. If the distance is more than 750 feet, no bonus should be given.	Percentage increase in the maximum lot coverage. The percentage should be based on a sliding scale which for example decreases for every additional 100 feet distance a building is sited away from the transit station. Decrease in the required parking.
C. PARKING ACCESS - Direct pedestrian access is provided from the building to a parking structure or lot on the same site or adjacent to it. If the access is covered, an additional bonus is given.	Increase in the maximum floor area ratio and height.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

2. PURPOSE: IMPROVED ACCESS TO TRANSPORTATION FACILITIES

Amenity	Bonus
D. OFF-STREET PASSENGER LOADING - Direct pedestrian access is provided to a loading berth. Available only to hotels, motels, or similar places of public assembly. The loading area shall open directly to a public hallway or covered pedestrian walk and shall have separate ingress and egress lanes.	Increase in the maximum floor area ratio and height.
E. OFF-STREET FREIGHT LOADING (DELIVERY AREA) - A common loading area serving several buildings is provided. An additional bonus is given if facilities for expansion are provided. Other bonuses can be related to buffering the loading area from view. Separate ingress and egress lanes shall be provided.	Increase in the maximum floor area ratio or percentage increase in the maximum lot coverage. Decrease in setback requirements, required lot size, or required lot dimensions to allow clustering of buildings sharing the common facility.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

3. PURPOSE: INCREASED LIGHT AND AIR

Amenity	Bonus
A. REDUCED BUILDING COVERAGE - A larger portion of the lot is open to the sky above. The greater the percentage of decreased lot coverage, the larger the bonus. Building coverage could also be decreased on lower floors to provide views through to the waterfront.	Increase in the maximum floor area ratio and maximum height.
B. INCREASED SETBACKS (YARDS) - Buildings are setback from the lot line more than required. Buildings are sited to take advantage of exceptional views. Additional bonus is given when a building is setback more than required from shoreline.	Increase in the maximum floor area ratio and maximum height. The bonus increases in proportion to the width of the setback.
C. UNINTERRUPTED AND CONNECTED PLAZAS OR OPEN AREAS - Plazas or open areas are unobstructed from their lowest level to the sky. Additional bonus is given when the plaza or open area is shared in common with other buildings and uses and connects with a street.	Increase in the maximum floor ratio and maximum height. Decrease in setback requirements to encourage clustering of buildings and uses and sharing of common open space.

TABLE XIV.

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

3. PURPOSE: INCREASED LIGHT AND AIR

Amenity	Bonus
D. OBSERVATION DECKS - An observation deck or other viewing space is provided within a building at a height which enables a clear field of vision. A view of the waterfront is desirable. The viewing space is made available to the general public during daytime and and possibly evening hours. This amenity is useful where existing land use is already dense and views are obscured.	Decrease in the required lot size, dimensions, and setbacks. Increase in the maximum floor area ratio and height.
E. SITING OF BUILDINGS, STRUCTURES AND SIGNS TO ENHANCE VIEWS AND LIGHT INTRUSION - Buildings are sites to open up views and to decrease the effect of shadows on other buildings. Structures and signs are sited in such a way that they do not obstruct views of a landmark, the skyline, or waterfront. All buildings, structures and signs are sited to increase the open areas which will be in sunlight during the day-time hours.	Decrease in the required lot size, dimensions, and setback. Increase in the floor area ratio or percentage increase in the maximum building coverage.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

4. PURPOSE: INCREASED PEDESTRIAN AND TRANSPORTATION AMENITIES

Amenity	Bonus
A. PLAZAS, OPEN SPACE AND FURNITURE - Plazas and open space are provided between streets and the building entrance. The plaza or open space serves as a rest area. Benches, planting, water features, works of art and other enhancements increase the bonus. Plazas or open space at ground level receive a higher bonus than those above ground level. An additional bonus is available when plazas and open space are interconnected.	Increase in the maximum floor area ratio and height. Decrease in one required setback if another setback is increased.
B. LANDSCAPING - Additional landscapping over what is required is provided. Trees receive the highest bonus because of their ability to screen, guide traffic, provide shade, and frame views. Small trees, shrubs and hedges receive the next highest bonus. Flowers, vines and low-growing plant materials receive the lowest bonus. Any plant material which has brilliant color receives additional bonuses.	Increase in the maximum floor area ratio and height. Decrease in the lot size, dimensions, setbacks. Percentage increase in the maximum lot coverage.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING

4. PURPOSE: INCREASED PEDESTRIAN AND TRANSPORTATION AMENITIES

Amenity	Bonus
C. ARCADES - Connection between a building and a street, between two or more streets, between two or more buildings, between plaza and buildings or any such conbination is provided by an arcade which is open and unobstructed to a height of twelve feet or more. A covered arcade receives a higher bonus. Interconnected arcades also receive a higher bonus.	Increase in the maximum floor area ratio and height. Decrease in the lot size, dimensions, and setbacks. Percentage increase in the maximum lot coverage.
D. LANDSCAPED ROOF DECK - A roof deck is located on a building or in a building and is open to the sky or is open to a waterfront view. A higher bonus is received when the deck is landscapped.	Increase in the maximum floor area ratio and height. Decrease in the required lot size, dimensions, and setbacks.
E. INCREASE IN OFF-STREET PARKING - Parking spaces are provided over the required amount.	Increase in the maximum floor area ratio.
F. CONSOLIDATED OFF-STREET PARKING - A common parking area serving several buildings is provided. The bonus is increased if landscaping, lighting, arcades, or other improvements are made to the parking area. The bonus is further increased if an area is provided for future expansion.	Increase in the floor area ratio or maximum height. Decrease in the required setbacks and frontage.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

4. PURPOSE: INCREASED PEDESTRIAN AND TRANSPORTATION AMENITIES

Amenities	Bonus
G. PARKING WITHIN PRINCIPAL BUILDING - Parking is enclosed and provided within the building served.	Increase in the floor area ratio or maximum height. Decrease in the required lot size, dimensions, and setbacks. Percentage increase in the maximum lot coverage.
H. ENHANCEMENT OF OFF-STREET PARKING AREA - Design elements are provided that enhance the off-street parking area. Elements include buffered location or siting, good relationships to the principal use, changes in the parking lot level for screening, fencing, landscapping, pavement, lights, bumper guards, directional signs, and a maintenance program.	Increase in the maximum floor area ratio and height.

5. PURPOSE: INCREASED CONSTRUCTION AND LOCATION OF DESIRABLE USES

A. SITING OF USES IN ACCORDANCE WITH THE HARBOR DEVELOPMENT PLAN - A developer is willing to construct or establish the desirable use recommended in the harbor development plan. The use is also sited as recommended by the harbor development plan.	Decrease in the required lot size, dimensions, and setback. Increase in the floor area ratio or percentage increase in the maximum building coverage.

TABLE XIV. 6.1

AMENITIES AND BONUSES FOR BONUS ZONING (cont.)

5. PURPOSE: INCREASED CONSTRUCTION AND LOCATION OF DESIRABLE USES

Amenities	Bonus
B. HIGH QUALITY ARCHITECTURAL DESIGN - The architectural design or motif of buildings is in character with the established or intended architectural design of the harbor area. Bonus is increased when additional architectural features of quality design are provided such as window boxes or lighting.	Decrease in required lot size, dimensions, and setbacks. Increase in maximum floor area ratio and height. Percentage increase in maximum lot coverage.
C. BUFFER PROVISIONS - Screening and buffers are provided by fences, walls, and landscaping. Delivery and disposal areas are buffered. Objectionable views are screened to lessen their impact on uses that are compatible to the harbor zoning district. Privacy is protected by means of fences and walls. Fences, walls, and trellises that are constructed of materials characteristic to the harbor receive additional bonus. This might include wood fences or stone walls. Landscaping is provided as a wind and noise break. Bonus for decrease in the height of fences, walls, and landscaping are given when a view is preserved, light and air are increased, or site distance is increased.	Decrease in required lot size, dimensions, and setbacks. Increase in maximum floor area ratio and height. Percentage increase in maximum lot coverage.

XIV. 7 VARIANCES

7.1 Definition

On occasion, an applicant or developer may wish to construct a building or make use of land in a manner which is not allowed by the zoning ordinance or by-law.

The applicant's relief is to request a variance from the provisions of the zoning ordinance or by-law.

Variances may be granted by the permit granting authority usually the board of appeals; however, as with special permits, the board of appeals may give this responsibility to a zoning administrator

7.2 Variance Granting Authority

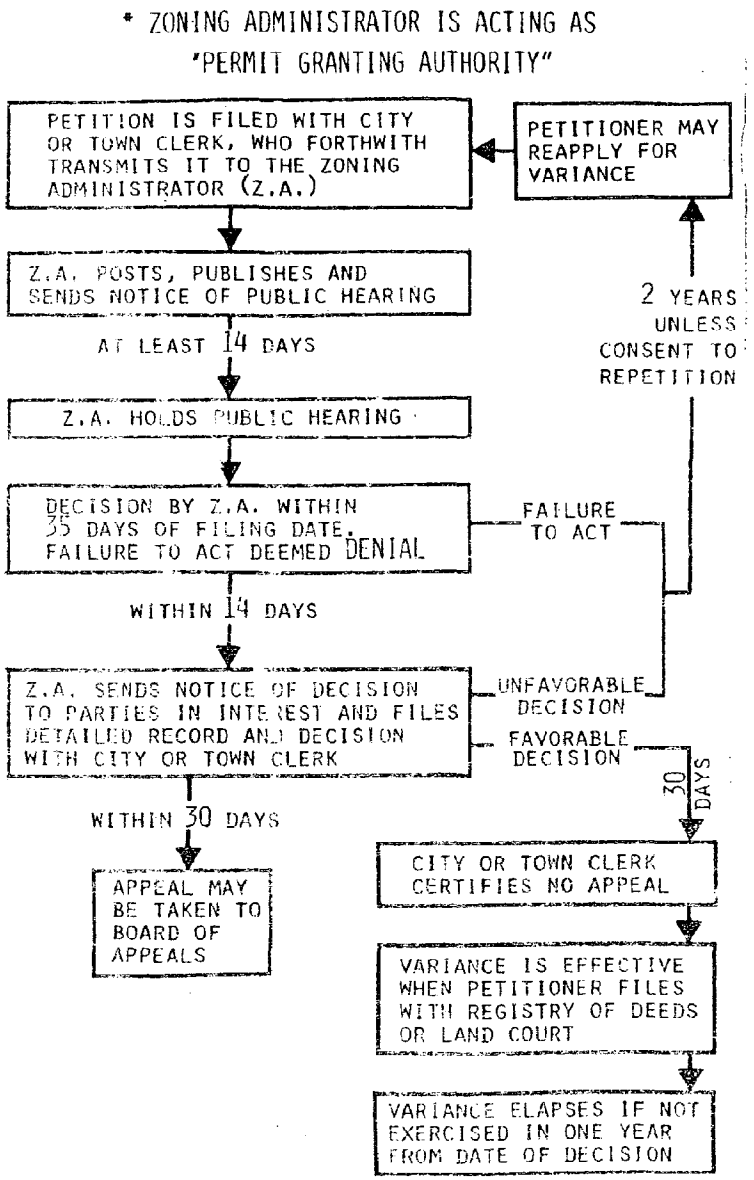
Variances are generally granted for dimensional purposes. For example, an applicant may not be able to meet the front yard setback requirement and therefore would need permission from the permit granting authority to vary from this setback. This authority has the power to determine whether the variance should be granted. The process they follow is set forth within The Zoning Act and is shown on Figure XIV. 7.1.

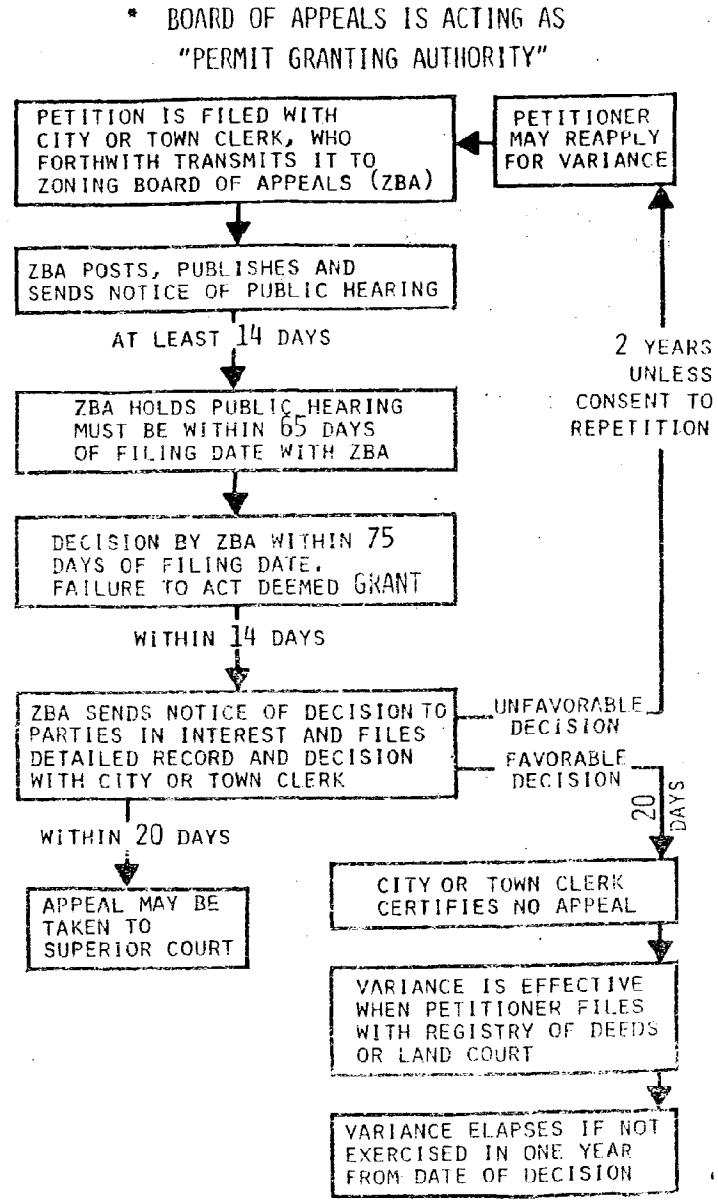
7.3 Variance Granting Procedure

Before the permit granting authority may issue a variance, they must make four findings. The written decision must specifically discuss each of the findings or a valid variance has not been granted. All four conditions must be met.

FIGURE XIV 7.1

VARIANCE PROCESS (CONSULT G.L. CHAPTER 40A FOR COMPLETE AND BINDING TEXT)





XIV. 7.4 Findings

The permit granting authority must find the following:

a. that theland or structure in question is affected by unique soil conditions, shape or topography which generally do not affect other land or structures within the zoning district;

b. that the applicant would be put under a hardship, financial or otherwise, if the variance were not granted;

c. that the variance may be granted without nullifying or substantially derogating from the intent and purpose of the zoning ordinance or by-law. (In other words, because there is a specific purpose for zoning within the community, and there usually are reasons why the particular zoning district was established; the permit granting authority must weigh the evidence and decide whether granting the variance would in fact make these purposes void); and

d. that the variance may be granted without detriment to the public good. (That is, will granting the variance cause damage or hurt someone else or the community on the whole.

XIV. 8 CONCLUSION

No matter what zoning regulations are adopted by a community to manage land uses in a harbor area, the zoning must be flexible and up to date.

The best way to effectively implement a harbor plan is to require special permits for most uses within the harbor district. A community must provide incentives to developers to offset the delays involved in obtaining special permits.

It is strongly recommended that each year the legislative body of the community should review and evaluate the effectiveness of zoning for harbor revitilization and management.

Zoning provisions must be continually amended and updated to efficiently meet community objectives.

COASTAL ZONE
INFORMATION CENTER

NOAA COASTAL SERVICES CENTER LIBRARY
3 6668 00002 7880