Assessing the Impact of the Wetlands Program: The Effect of Wetlands Regulations on Development- The Developer's Perspective in Massachusetts

by

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B.S., Union College
(1973)

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS OF THE
DEGREE OF

MASTER OF CITY PLANNING

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1980

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May 20, 1980

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ASSESSING THE IMPACT OF THE WETLANDS PROGRAM: THE EFFECT OF WETLANDS REGULATIONS ON DEVELOPMENT- THE DEVELOPER'S PERSPECTIVE IN MASSACHUSETTS

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Submitted to the Department of Urban Studies and Planning on May 20, 1980 in partial fulfillment of the requirements for the Degree of Master of City Planning

ABSTRACT

The Massachusetts Wetlands Protection Act establishes local control of a state mandated wetlands protection program. This thesis explores how developers perceive a multiplicity of interpretations of the Wetlands Protection Act by wetlands program managers at the local level and the perceived effects these variations have on development in or near wetland areas. These effects include the perception of increasing risk, uncertainty, and cost in the highly speculative development business.

Chapter One of this thesis is the introduction. Chapter Two is an examination and comparison of the socio-economic data and the conservation commission records of the two study areas, Quincy and Falmouth. Chapter Three is an exhaustive description of local, state, and federal wetlands regulatory programs. Chapter Four is a detailed description of twenty-seven interviews with land developers, builders, realtors, bank mortgage officers, and the chairmen of the Quincy and Falmouth Conservation Commissions. Chapter Five is a discussion and analysis of the seven central themes in the developer survey and a comparison of the results of this survey with the results of a wetlands residential property owner survey done in 1979. And finally Chapter Six contains the conclusions and policy recommendations expressed by developers and builders.

The statements reported in this thesis are only perceptions, often quoted verbatim, and should not be accepted as statements of fact. Furthermore, the opinions expressed in the survey belong to the interviewees and should not be mistaken as those of the author.

Thesis Supervisor: Dr. Richard D. Tabors

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ACKNOWLEDGEMENTS

I would like to thank Tom Leschine, Dick Tabors, Judy Kildow, and Gary Hack for all their advice and direction with my thesis. In addition I am grateful for all the help and assistance I received from Clara Yeomans and James Donahue of the Quincy Conservation Commission, and Marjorie Donavan and Peter Perpall of the Falmouth Conservation Commission, Warren Harrington of Marshfield, the Department of Environmental Quality Engineering, Department of Environmental Management, and especially all the land developers, builders, bankers, engineers, and realtors who were kind enough to give me their time and attention.

I also want to thank my good friends who have been supportive of me during the last six months: Kristen for not complaining about all the dishes or the lack of a birthday present as well as all her moral support; Sherry for fixing all those dinners; Howard for his advice and sense of humor and perspective; and Fred and Rick for their encouragement. Last but not least I want to thank Holly Altman for doing all the typing at ridiculous hours of the day and night.

CHAPTER ONE

INTRODUCTION

Across the street from my childhood home in southern New York was a swampy lowland. In rainy weather a series of ponds would form along the brook that ran the full length of the vacant property. During the warmer months, it was a great place for catching frogs, tadpoles, and polly-wogs. During the colder months, it was a great place for skating, snow forts, and snowball fights. When I was eight or nine, a builder bought the land, filled the swampy areas, piped the brook, and built two dozen houses.

My parents were happy the land had been developed; to them it was nothing but a swampy, unattractive and useless tract of land and another place for their four sons to get in trouble, a common event in those days. My brothers' feelings and mine were mixed; we lost a great place to play but the new families that moved in had children our age. Our enlarged gang shifted its playing to an upland area owned by the local Catholic church. Before too long the swamp became a distant memory.

Then along with the sixties and seventies came environmentalism. A smelly swamp which so many people thought was useless was now called an inland wetlands, an important resource for flood control, groundwater supply, and prevention of pollution. Along with the new names, attitudes

changed, a movement developed, and a series of local, state, and federal laws were passed to protect a fragile and rapidly disappearing resource.

An Historical Review of Wetlands Protection

Even as far back as the late fifties and early sixties, local governments in Massachusetts began forming conservation commissions for better management of their environmental resources. In addition many towns passed wetlands protection bylaws, flood plain zoning bylaws, and/or established flood plain protection districts. Many localities passed bonds for aggressive wetlands and open space acquisition programs.

In Massachusetts, an active state legislature passed the Conservation Commission Act in 1958, the Coastal Wetlands Protection Act in 1963, the Inland Wetlands Protection Act in 1965, the Coastal Wetlands Restriction Act in 1965, the Inland Wetlands Restriction Act in 1968, and finally the Wetlands Protection Act in 1972. Many of these laws were recently incorporated into the U.S. Department of Commerce approved Massachusetts Coastal Zone Management Plan.

The federal government embarked on its own ambitious programs to protect wetlands. In 1968 the first National Flood Insurance Act was passed followed by two Flood Disaster Protection Acts in 1973 and 1974. In 1972 Congress passed the Coastal Zone Management Act and the Federal Water Pollution Control Amendments.

Purpose of Thesis

The Massachusetts Wetlands Protection Act establishes local control of a state mandated wetlands protection program. My thesis explores how developers and builders perceive a multiplicity of interpretations of the Wetlands Protection Act by wetlands program managers and the perceived effects these variations have on development in or near wetland areas. These effects include the perception of increasing risk, uncertainty and cost in the highly speculative development business.

Chapter One of my thesis is the introduction. Chapter Two is an examination and comparison of the socio-economic data and the conservation commission records of the two study areas, Quincy and Falmouth. Chapter Three is an exhaustive description of local, state, and federal wetlands regulatory programs. Chapter Four is a detailed description of twenty-seven interviews with land developers, builders, realtors, bank mortgage officers, and the chairmen of the Quincy and Falmouth Conservation Commissions. Chapter Five is a discussion and analysis of the seven central themes in the developer survey and a comparison of the results of this survey with the results of a wetlands residential property owner survey done in 1979. And finally Chapter Six contains the conclusions of my thesis and conveys the policy recommendations expressed to me by builders and developers.

The statements reported in my thesis are only perceptions, often quoted verbatim, and should not be accepted as statements of fact. Furthermore, the opinions expressed in the survey are those of the interviewees and should not be mistaken as my own.

Study Areas

As study areas I have chosen the City of Quincy and the town of Falmouth. These study areas are not necessarily representative of all towns and cities in Massachusetts but I think the information I have collected will be useful and insightful to wetlands program administrators throughout the state. I chose the City of Quincy for my thesis because the data collected will be used by the Boston Harbor Management Project in devising a new management scheme for Boston Harbor. I selected the town of Falmouth because extensive data on construction in wetland areas is already available. Both study areas are also within easy transportation access of the two cooperating institutions, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution.

Many of the people I talked to had encountered wetlands regulations in other towns besides Quincy and Falmouth. These conversations shed light on many of the concerns of my thesis, such as the evenness of enforcement from town to town, so they have been included and are an important part of my research.

I should point out that developers' etc. perceptions

of wetlands regulatory impact are only one side of a many sided story. In order to get a more complete picture of wetlands protection programs fishermen, ecologists, environmentalists, hydrologists, property owners, naturalists, and many others would need to be interviewed. Still, I think that this thesis reveals an extremely interesting and important view of wetlands regulatory impact.

CHAPTER TWO

PROFILE OF THE STUDY AREAS

Quincy

Incorporated in 1888, Quincy is the ninth largest city in the Commonwealth of Massachusetts and is the largest and most densely populated of twenty-four cities and towns that make up the area commonly known as the South Shore. On the north it is bordered by Boston, on the south by Weymouth and Braintree, on the west by Milton and on the east by twenty-seven miles of waterfront that is part of Boston Harbor.

Ever since the turn of the century, Quincy has experienced a steady population growth. Much of the growth has been caused by migration, especially from areas such as Dorchester and South Boston. The last available population statistics reveal a four percent growth between 1970 and 1975. By 1990, projections are that the population will level out around 96,000, a five percent increase from 1975.

Several reasons contribute to this steady growth: 1) Quincy is perceived as a healthy and desirable place to live; 2) since 1962 more than 5000 multi-family units and more than 500 single family units have been constructed; 3) in addition nearly 2200 elderly or low rent housing units have been built during this same period of time; and 4) the desire to be near Boston brought about by the energy crisis

has resulted in an increase in Quincy's population.[1]

The population of Quincy is more than ninety-nine percent white. Nearly a third of the population in 1977 was older than fifty years old. In 1970 the median income of families and unrelated individuals was $11,094, just slightly below the SMSA median average of $11,449.

Quincy is the largest manufacturing employer on the South Shore. In 1978 Quincy's two largest employers, General Dynamics and Boston Gear employed more than 4,000 workers. The manufacturing sector represents roughly twenty-seven percent of total employment.

Over the years the manufacturing sector's share of total employment has declined significantly. In the sixties forty-nine percent of Quincy's work force was employed by manufacturers. General Dynamics, the city's largest employer, receives large defense contracts and therefore is extremely vulnerable to volatile national trends.

In the past twenty-five years Quincy has become a center of wholesale and retail trade, banking, and finance. In 1976 nearly 1,400 firms employed more than 28,000 persons. Retail trade has represented approximately twenty-five percent of the total work force. But in the larger time frame the number of firms dropped four percent from 1970 - 1976 with a corresponding decline in employment of close to fifteen percent. The drop in employment has all been in the retail trade, communications, utilities, and agriculture

sectors. Meanwhile manufacturing, wholesale trade, real estate, insurance, and services employment have risen since 1973.

The drop in the number of business establishments corresponds to general economic trends in Massachusetts. Many firms have decided to move to areas where business and energy costs are lower. In addition, "the availability of alternative sources of suitable land, accessibility, and lower building costs have all contributed to the recent decline in employment and business establishments in Quincy."[1]

Reflecting regional and national trends Quincy experienced severe unemployment after the recession of 1974-1975. The 1975 unemployment rate for Quincy was eleven percent while the national rate was only eight and one half percent. Since that time the local economy has made steady but slow improvement. The 1978 unemployment rate was six and one half percent. Throughout the seventies, jobs were leaving Quincy. Finally it appears the situation is stabilizing.

Construction was the second smallest sector of the Quincy economy in 1978. New housing and residential alterations represented roughly half of the estimated cost of all construction in the past ten years. Approximately

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[1]Community Development Block Grant Application, Program Year Five, July 1979, Quincy Department of Planning and Community Development, p.6

5,000 dwelling units were built in Quincy in the seventies, which represented an increase of roughly fifteen percent of Quincy's total housing stock. Like other Boston suburbs, the developed portion of the shoreline is mostly housing with the exception of the Quincy shipyards.

Falmouth

Incorporated in 1686, Falmouth is the second largest of the sixteen towns that make up the hook shaped peninsula known as Cape Cod in southeastern Massachusetts. The town is situated on the southwestern tip of the Cape and bordered by the town of Bourne on the north, Mashpee on the east, Vineyard Sound on the south, and Buzzards Bay on the west. Falmouth is roughly seventy miles south of Boston. Like many other Cape Cod towns, Falmouth is an important resort and retirement community with a strong salt water recreation orientation. The town contains roughly fifty-five miles of tidal shoreline.

In the past twenty-five years Falmouth has experienced exceptionally rapid population growth. In the ten years between 1965 and 1975, Falmouth's population increased by nearly fifty percent to roughly 20,600. The predicted population for 1980 represents an additional growth of fourteen percent to 23,600. The projection for 1990 is continued population expansion to 28,800, a thirty-nine percent increase over 1975.

Most of this rapid population growth has been caused by in-migration, heavily weighted in the 45 and older age categories. People are attracted to Falmouth as a summer resort community, and ultimately as a retirement home. The summer population in Falmouth is more than double the year round population. In 1975 more than 51,000 people summered in Falmouth compared to a winter population of 20,600. This trend is expected to continue through the 1980's and 1990's. By 1995 the summer population is projected to exceed 80,000.

In the 1970 census ninety-six percent of Falmouth's population was white. Blacks represented approximately two and a half percent with other minorities making up the difference. The census also revealed that twenty-eight percent of the population was over fifty years old. Twenty-nine years old and under represented more than forty-nine percent of the total population.

In 1969 the mean income of all families and unrelated individuals was $9,594, or the fourth highest in Barnstable County. The median income of all families and unrelated individuals for the same year was $8,324 compared to a county average of $7,362. The per capita income for Falmouth in 1969 was $3,292, slightly lower than the county average of $3,353. By 1975 the per capita income had increased to $4,672 in Falmouth and $4,848 county-wide. This represented a forty-two percent increase in Falmouth.

Falmouth has the second largest labor force of all the towns on the Cape; only Barnstable's is larger. In 1978 and 1979 the annual average labor force was slightly larger than 12,600. From statistics compiled in 1977, wholesale and retail trade was the largest sector representing thirty-nine percent of average employment, followed closely by services representing thirty-eight percent, and construction as a distant third representing eight percent of the annual average. During that same year there were 677 firms in Falmouth with a total payroll of $52,327,680. In 1978 the unemployment rate was 7.2 percent. In 1979 it dropped slightly to 6.8%.

In 1972 the Cape Cod Planning and Economic Development Commission compiled land use data for Barnstable County. In Falmouth fifty-three percent of the land was still forest, thirteen percent was wetlands, ten percent was agricultural or open land, and only twenty-one percent was developed or urban land. Of the urban land eighty-seven percent was residential, five percent was commercial, and only one percent was industrial.

Construction was the third largest sector of the Falmouth economy. Cape Cod in general has long been regarded as one of the strongest centers for housing construction in New England. In 1977, construction accounted for nearly ten percent of Falmouth payrolls. Housing construction and the housing market has been largely driven by the demand for

second and retirement homes. The developed portion of the shoreline is almost entirely devoted to housing.

In the 1970's, 4,246 housing units were authorized by building permits in Falmouth. This represented a forty-four percent increase in Falmouth's housing stock over the decade. In the past three decades average annual housing construction has steadily risen: in the fifties 298 units, in the sixties 311 units, and in the seventies 425 units. Most recently the annual authorized housing units have been lower than the decade average: 336 in 1978 and 345 in 1979. Of the units authorized in 1979, 316 were single family and 29 were 3 to 4 family condominium units. These new units had an estimated cost of roughly $12,000,000 or 70% of the total cost of construction in Falmouth in 1979. During the same year 58 non-residential building permits were issued representing an expenditure of nearly $3,000,000 or 17% of the total cost of construction.

Comparison of the Study Areas

In 1975 Quincy's population was approximately five times greater than Falmouth. The 1970 Census revealed that the percentage breakdown for age groups, 29 and under, 30-59, and 60 and older and the median age were almost

identical for the two localities. Quincy is roughly one third the size of Falmouth, and has a population density nearly twelve times as great. Falmouth's fifty-five miles of tidal shoreline is twice as long as Quincy's.

Wholesale and retail trade is the largest sector of the economy in both municipalities. Manufacturing is the second largest sector in Quincy but is the fourth largest sector in Falmouth. The 1970 Census revealed that the median average income of families and unrelated individuals was nearly a third larger in Quincy than Falmouth.

From 1969 to 1978 over ninety percent of authorized housing units in Quincy were multi-family apartment; many of these were for elderly housing. During that same period, just over 200 building permits were issued for single family homes. In contrast development in Falmouth has been almost all single family homes; over 400 units were authorized annually in the seventies.

Although both Quincy and Falmouth have appointed conservation commissions, joined the Flood Insurance Program, and passed Flood-plain bylaws, the regulatory climate is slightly different in the two municipalities. First of all only Falmouth has a wetlands bylaw which in addition to protecting the seven interests of the Wetlands Protection Act also protects wildlife, aesthetics, and recreational values. On the other hand some wetlands in Quincy are restricted under the Coastal Wetlands Restriction Act.

The large marsh near Squantum in North Quincy was restricted in the late sixties. DEM has indicated that once they have completed restricting wetlands on Cape Cod (including Falmouth), other coastal and inland wetlands in Quincy will be restricted.

An examination of conservation commission files revealed 88 Order of Conditions issued in Quincy and 164 Order of Conditions issued in Falmouth from 1972 to 1979. Falmouth's large areas of vacant land make it a prime location for single family home construction which is the largest category of Order of Conditions, 35 percent. The shoreline in Quincy is almost entirely developed; remaining vacant lots are of marginal quality. Only 11 percent of the Quincy's Order of Conditions were for single family homes. The largest category in Quincy was for filling, 32 percent.

A large number of applicants in Falmouth file Notice of Intents to construct shoreline structures such as sea walls, riprap, bulkheads, groins, and jetties. Over 17 percent of the Order of Conditions fell in this category. In contrast less than 10 percent of the Orders in Quincy were for shoreline structures; much of Quincy's shoreline was already protected. The only other significant difference between the two municipalities were the large number of public works projects that came before the Quincy Conservation Commission, 23 percent of all Order of Conditions; Falmouth public work projects represented only 7 percent.

Previous research discovered that the number of cases actually processed by conservation commissions is surprisingly small compared to the level of building activity around wetlands. It appears that systematic evasion of permit requirements for small-scale activity is widespread in Falmouth. During the years 1972-1977 only eight Order of Conditions were issued for single family homes in Falmouth. In the next two years fifty Order of Conditions for single family homes were issued. Meanwhile, the building department issued 300-350 permits per year for single family homes during this period. It is difficult to determine whether new construction within the jurisdiction of the Wetlands Protection Act, since this area is not mapped.[1]

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[1]Thomas M. Leschine and Stephen R. Cassella, "A Profile of Wetlands Regulation in Coastal Massachusetts Towns: Local Regulatory Activity and the Public Perception of Effects," November 1979, p.7

CHAPTER THREE

THE REGULATORY CLIMATE

Although private property rights are considered sacred in the United States, these rights do not include a use of property that is harmful to the public health, safety, and welfare. When a hazard to the general welfare can be proved, governments have the right to exercise what is known as police power. When this hazard is not proved, regulatory action that deprives the owner's use of his land without compensation is considered an unconstitutional taking of land.

Local, state, and federal legislative bodies have passed laws that regulate the use of private property to prevent actions that might adversely affect public health, safety, or welfare. Wetlands use regulation is an exercise of this control. Other examples of police power are building codes, health regulations, and zoning.

While the central piece of legislation regulating the use of wetlands in Massachusetts is the Wetlands Protection Act, a whole suite of regulations, directly and indirectly related to wetlands protection, determine the regulatory climate in which developers and builders make their decisions about the feasibility of a project that contains wetlands.

State laws besides the Wetlands Protection Act include:

1) The Inland Wetlands Restriction Act (G.L. Ch.131, Sec. 40A)
2) The Coastal Wetlands Restriction Act (G.L. Ch. 130, Sec. 105)

Federal laws include:

1) The Flood Disaster Protection Act of 1973
2) The Federal Water Pollution Control Ammendments of 1972 (PL95-214)
3) The River and Harbors Act of 1899

Local laws include:

1) Flood plain zoning bylaws
2) Other town bylaws

I have prepared a detailed discussion of the regulatory climate in wetlands.

The Wetlands Protection Act
G.L. Ch.131, Section 40)

The Wetlands Protection Act passed in 1972 is a combination of two acts; it repealed the Jones Act (Coastal Wetlands Protection Act, Ch.426 of the Acts of 1963) and amended the Hatch Act (Inland Wetlands Protection Act, Ch.220 of the Acts of 1965). The Wetlands Protection Act gave "front line authority to the municipal conservation commissions (or selectmen/mayor where no commission exists), with the state reserving the right to issue superseding permits on its own or on appeal."[1] In 1974, the Department of Environmental Quality Engineering (DEQE) promulgated wetlands

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[1]Environmental Handbook for Massachusetts Conservation Commissioners, published by Massachusetts Association of Conservation Commissions (MACC), Medford, MA., 1978, p.35

regulations for administration of the Wetlands Proection Act. These regulations were ammended in 1977 and 1978.

The Wetlands Protection Act requires that no person, including governmental agencies or authorities may fill, dredge, remove, or alter "any bank fresh water wetland, coastal wetland, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or any estuary, creek, river, stream, pond, or lake, or any land under said waters, or any land subject to tidal action, coastal storm flowage or flooding"[1] or any area within 100 feet of these wetlands without filing for a permit with the local conservation commission.

The Wetlands Protection Act was passed to protect seven environmental interests:

1) public or private water supply;
2) groundwater supply;
3) flood control;
4) storm damage prevention;
5) prevention of pollution;
6) protection of land containing shellfish;
7) protection of fisheries.

The first step in the permit process is the filing of a "Request to Determine Applicability of the Wetlands

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[1] The Wetlands Protection Act: Questions and Answers, published by Executive Office of Communities and Development (EOCD), 1979, p.1

Protection Act" to the local conservation commission. This form constitutes a binding decision by the conservation commission concerning the applicability of the Act to either the proposed project, the site of the project or both. Although this is not an obligatory step in the permit process, an applicant can avoid a hearing if the conservation commission responds to his request with a negative determination. If this is the case the applicant may begin work ten days after the ten day appeal period has ended. If the conservation commission responds with a positive determination, then the applicant is required to file a Notice of Intent to do the proposed project.

Prior to filing the Notice, an applicant must have filed for all other permits and variances required by local law. Previously an applicant could not file before all other permits had been approved. This was ammended in 1977 by Chapter 601 to allow an applicant to "file a Notice of Intent any time after applying for all permits, variances and approvals required by local bylaws, provided that the applicant include in the notice all information submitted with those other permit applications."[1] This ammendment was passed to decrease the delay period that an applicant experiences while filing for all the appropriate permits.

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[1] Ibid., Environmental Handbook, MACC, p.35

On the other hand the conservation commission can decide to continue the hearing on the project until after all other permits have been approved or require the applicant to file a new Notice of Intent if modifications are made by any other board or authority.

The conservation commission has to set a date for a hearing within twenty-one days after the receipt of the Notice of Intent. The applicant must place a notice of the public hearing in the local newspaper a minimum of five days before the hearing is held. Within twenty-one days after the hearing has been completed, the conservation commission must issue an Order of Conditions. This Order of Conditions must prescribe how the work is to be done in order to protect the seven interests of the Wetlands Protection Act. All work on the project must comply with the Order. If the Order of Conditions is not followed the conservation commission can issue a Cease and Desist Order which requires that the property owner stop all work until he/she has complied with the Order of Conditions. In addition the conservation commission may at the completion of a project request a Certificate of Compliance which certifies that all work on the project has been done in compliance with the Order of Conditions.

An applicant, an abuttor, an aggrieved individual or any ten local residents can appeal any decision by the local conservation commission whether it is a Determination

of Applicability, Order of Conditions, or a failure to hold a hearing. All appeals are made to the regional office of DEQE within ten days of the conservation commission decision. DEQE, itself, maintains the right to appeal conservation commission decisions if it feels the seven interests of the Act have not been adequately protected. Within seventy days after the appeal has been made, DEQE must issue a Superseding Order. If no appeal is made within ten days, then the Superseding Order becomes the Final Order.

However, if the applicant, an abutter, an aggrieved person, the conservation commission, or any ten local residents appeal the Superseding Order, then DEQE must arrange for a prehearing conference. If a settlement is negotiated at this conference then a Final Order is issued; if a settlement is not negotiated, then DEQE must hold an adjudicatory hearing. This hearing requires the services of an attorney and expert witnesses.

After this adjudicatory hearing, a Final Order is issued. This Order may be appealed within thirty days by the applicant or other aggrieved party. The appeal is made to Superior Court. It may require months or even years before a Superior Court action is made on the appeal. Regardless where the final decision is made in this appeal process, no work may begin on the project before the Final Order is recorded at the Registry of Deeds.

Certain activities are exempt from the Wetlands Protection Act:

1) mosquito control work

2) maintenance, repair or replacement of water gas, electric, or telecommunications utilities as long as they are not substantially changed or enlarged;

3) maintenance of drainage and flooding systems of cranberry bogs;

4) maintenance or construction of specific projects authorized by special acts passed prior to 1973;

5) maintenance dredging projects for which a license was issued in the last ten years by DEQE;

6) work performed for normal maintenance or improvement of lands already devoted to agricultural work;

7) any project which the conservation commission certifies is an emergency and has been ordered by a local, state, or federal governmental body. [1]

An example of an emergency project is the work that was ordered by the local governments in Marshfield and Scituate immediately following the February blizzard of 1978. Shorefront structures were rebuilt to prevent additional damage to coastal residences. At that time, the local conservation commissions issued a Certification of Emergency to permit the emergency work without a proper filing and hearing.

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[1] Ibid., Questions and Answers, EOCD, p.3

The Wetlands Protection Act regulations promulgated by DEQE list eleven Resource Areas which are to be protected in the coastal zone. They are:

1) Land under the ocean;
2) Designated port areas;
3) Coastal beaches;
4) Coastal dunes;
5) Barrier beaches;
6) Coastal banks;
7) Rocky intertidal shores;
8) Salt marshes;
9) Land under salt ponds;
10) Land containing shellfish; and
11) Fish runs.

I have included a brief discussion of each of these resource areas to explain why they are important to the seven interests of the Act, and to help define the boundaries of the Act.[1]

Land Under the Ocean:

"Land under the ocean" includes any land under a body of water that is influenced by tidal activity such as salt ponds, bays, tidal estuaries and rivers, as well as land under the ocean itself that falls within the municipal

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[1]Much of this discussion of resource areas relies on information from A Guide to Coastal Wetlands Regulations, published by Department of Environmental Quality Engineering, 1978

boundary.

A subcategory of land under the ocean is the nearshore areas. The regulations (Section 25b) define this area as the "land extending from the mean low water line to the seaward limit of a municipality's jurisdiction, but in no case beyond the point where the land is 80 feet below the level of the ocean at mean low water." The bottom topography of nearshore areas plays an important role in storm prevention and flood control:

> As waves travel from deep to nearshore areas, the natural bottom topography changes their direction and height because of refraction, bottom friction and percolation. The effect of these changes is to reduce the energy of the waves, thereby reducing storm damage and flooding.[1]

Land under tidal rivers and estuaries is also important for the protection of fisheries. This land is a spawning, nursery, feeding, and shelter area for commercial and recreational fish, crustaceans, and shellfish.

Designated Port Areas:

The regulations (Sections 24(2)-24(3)) designated twelve port areas:

Beverly Harbor	Lynn	Plymouth Cordage
Chelsea Creek	Mt. Hope Bay	Salem Harbor
East Boston	Mystic River	South Boston
Gloucester	New Bedford-Fairhaven	Weymouth Fore River

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[1] A Guide to Coastal Wetlands Regulations, published by Department of Environmental Quality Engineering (DEQE), 1978, p.10

Only land under the ocean in these designated port areas is considered significant to the seven interests of the Act. Just as land under the ocean not in designated port areas, this land contributes to the protection of fisheries, storm damage prevention, and flood control. In addition bulkheads, seawalls, and piers contribute to flood control and storm damage prevention.

The land adjacent to the water in designated port areas is usually paved or developed. Because of this, it is not considered significant to the Act, and therefore generally does not require an Order of Conditions.

Coastal Beaches:

The regulations (Section 27 (2)(a)) define the coastal beach as unconsolidated sediment subject to wave, tidal, and coastal storm action, including tidal flats that extend from the mean low water line landward to the dune line, coastal bankline, or man-made structures, whichever is closest to the ocean.

Coastal beaches are important for storm damage prevention and flood control. The coastal beach responds differently to various types of wave action. Steep storm waves force beach sediment offshore creating a gentler slope which reduces the energy of the storm waves. During calmer weather, short waves push sediment landward, changing the shape of the beach to prepare it for a future storm.

Coastal Dunes:

Coastal dunes are defined (Section 28(2)) as "any natural hill, mound or ridge of sediment landward of a coastal beach deposited by wind action or storm overwash" or by man to serve the purpose of storm damage prevention or flood control.

Dunes supply adjacent coastal beaches with sand during storms as well as provide a buffer between storm waves and landward properties. "Without the supply of sand from coastal dunes, beaches will gradually be depleted of sediment. (The sand that moves from the dune to the beach originally was carried by wind from the beach to the dune.)"[1]

Barrier Beaches:

A barrier beach is defined in the regulations (Section 29(2)) as "a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the tread of the coast. It is separated from the mainland by a narrow body of fresh, brackish or saline water or a marsh system." Falmouth and Qunicy have barrier beaches within their boundaries. In fact Falmouth has a greater number of barrier beaches than any other town except Nantucket. All coastal dunes in a barrier beach are considered to be significant to storm damage prevention and

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[1] Ibid., p.26

flood control. Since barrier beaches consist of coastal dunes and coastal beaches, the concepts discussed in those sections apply here.

Coastal Banks:

Coastal banks are defined in the regulations (Section 30(2)) as "the seaward face or side of any elevated landform, other than a coastal dune, which lies at the landward edge of a coastal beach, land subject to tidal action, or other wetland."

Just as sand dunes, coastal banks serve two functions: 1) they erode under the force of storm waves and supply coastal beaches with sand; and/or 2) they act as a buffer for the protection of landward properties.

Rocky Intertidal Shores:

Rocky intertidal shores are defined in the regulations (Section 31(2)) as "naturally occurring rocky areas such as bedrock or boulder strewn areas between the mean high water line and the mean low water line."

The boulders help dissipate storm wave energy and are therefore important for storm damage prevention and flood control. In addition a variety of plants and animals are specially adapted to life on rocky intertidal shores. Crustaceans and molluscs (snails and mussels) are some of the more dominant communities. Therefore this resource area should be considered significant to the protection of

marine fisheries and land containing shellfish.

Salt Marshes:

A salt marsh is defined in the regulations as a "coastal wetland that extends landward up to the highest tide line...and is characterized by plants that are well adapted to, or prefer living in saline soils." Spartina palens and Spartina alterniflora are the dominant plants that identify a salt marsh.

Like sand dunes and coastal banks, salt marshes serve as a buffer to reduce damage from storm waves. In addition the underlying peat serves as a protective barrier between fresh groundwater and salt water. Salt marshes also act as a filter to reduce pollution from the coastal zone (runoff, etc.).

Salt marshes are additionally important to the protection of marine fisheries. Large volumes of organic material (detritus) is flushed into the ocean with every ebb tide. Detritus and dissolved nutrients are the basis of marine food chains. Destruction of a salt marsh will reduce its productivity which could have ramifications further down the food chain.

Land Under Salt Ponds:

A salt pond is defined in the regulations (Section 33(2)) as "a shallow enclosed body of saline water that may be partially or totally restricted by barrier beach

formation. Salt ponds may receive freshwater from small streams emptying into their upper reaches and/or springs in the salt pond itself."

Oyster Pond, Salt Pond, and Little Pond in Falmouth are three of the major salt ponds identified by the Massachusetts Division of Marine Fisheries. These salt ponds are important to the protection of marine fisheries and land containing shellfish. Primary production of phytoplankton, algae and other plant communities occurs in salt ponds, thus contributing to marine productivity further down the food chain.

Land Containing Shellfish:

Land containing shellfish is defined in the regulations (Section 24(2)(a)) as "land under the ocean, tidal flats, rocky intertidal shores, and land under salt ponds when any such land contains shellfish."

There are several characteristics of land containing shellfish which make it important to the interests of the Act. They "are (a) shellfish, (b) water quality, (c) water circulation, (d) the natural relief, elevation and distribution of sediment grain size of such land."[1]

Shellfish themselves are important to man as a high protein food source. In addition in their young life stages

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[1]Ibid., p.42

they are a significant source of food for marine fish and crustaceans which have important recreational and commercial value.

Fish Runs:

An anadramous/catadromous fish run is defined in the regulations (Section 35 (2)(c)) as "that area within estuaries, ponds, streams, creeks, rivers, lakes, or coastal waters, which is a spawning or feeding ground or passageway for anadromous or catadromous fish." In Falmouth there are no fewer than nine rivers, brooks, or ponds that serve as a fish run for alewife or brook trout. In Quincy there are two rivers and one brook that serve as a fish run for rainbow smelt. These fish have commercial and recreational value as well as ecological significance to the marine environments.

The Wetlands Restriction Program

The Wetlands Restriction Program was designed to supplement the permit and regulatory approach of the Wetlands Protection Act. The Restriction Program consists of two acts: the Coastal Wetlands Restriction Act (G.L. Ch. 130 Section 105) passed in 1965 and the Inland Wetlands Restriction Act (G.L. Ch. 131 Section 40A) passed in 1968. The Commissioner of the Department of Environmental Management (DEM) in order to promote public health, safety, and welfare and to protect public and private property, wildlife,

freshwater and marine fisheries, water resources, flood plain areas, and agriculture is directed to issue orders restricting or prohibiting dredging, filling, removing, polluting, developing or otherwise altering inland and coastal wetlands. These wetlands include any bank, marsh, swamp, meadow, flat, freshwater wetlands, low land subject to tidal action or coastal storm flowage and "such contiguous land and the Commission of Environment Management reasonably deems necessary to affect by any such order."

DEM follows a fifteen step procedure to restrict inland wetlands; the restriction procedure for coastal wetlands is three steps less because DEM is not required to send a formal notice of restriction to the selectmen, steps 10, 11, and 12. The fifteen step procedure is:

1) DEM obtains aerial photographs and maps of proposed restricted areas on a county-wide basis.

2) DEM meets with the Selectmen of the various towns to explain the program.

3) The coastal geologist, marine fisheries biologist, and professional engineer on DEM's staff prepare a stereographic delineation of the town's wetlands that are one half acre or greater in size. Wetlands plant life are used to make the delineation. This delineation is then transposed on to orthophoto base maps (corrected aerial photos).

4) The delineation from the orthophoto base maps is then transferred to the local assessor maps. DEM compiles a list of assessed wetlands owners.

5) Workshops are held in town to familiarize people with the program and to obtain local review for possible additional wetland areas.

6) Thirty days in advance DEM mails a certified letter to wetland property owners notifying them of the hearing.

7) Five to seven days before the public hearing, DEM holds an informational meeting for wetland property owners.

8) DEM holds a public hearing in the town.

9) Wetland property owners can request an on-site visitation for a field check and possible survey of wetland areas.

10) DEM sends a formal notice of restriction to the Town selectmen with a complete list of restricted parcels.

11) The selectmen have thirty days to approve or disapprove the restrictions.

12) DEM has six months to iron out differences with the selectmen and if it chooses, to override a disapproval.

13) The Final Order and a map of restricted property is sent to the wetland property owner by registered mail and the restriction accompanied by a mylar of the map is recorded at the Registry of Deeds. The restriction is thereafter attached to the deed and is binding upon all present and future land owners. A copy of the order is also sent to the Land Court registry.

14) The wetland property owner has ninety days to appeal the restriction to the Superior Court.

15) Superior Court decides appeals.

The wetland property owner can petition the Superior Court to release the land from a restriction if he/she feels that the order so restricts the property as to

constitute a taking without compensation. Superior Court may rule that the restriction was unconstitutionally severe and remove the restriction from the parcel in question.

DEM has had problems delineating the boundary of some wetland areas particularly wooded swamps, dunes, and barrier beaches from the aerial photographs. Even though aerial photographs are taken in the spring, after the snow has melted and before leaves have formed on the trees, it is often nceessary to transect the seventy-five percent wetland vegetation line in wooded swamps. Dunes and barrier beaches present a different problem; they are a dynamic resource and periodically require a new delineation.

Implementation of the Wetlands Restriction Program has been extremely slow. Bottlenecks in the procedure have occurred at steps 4 (establishing ownership of wetland property) and 9 (site visits and negotiation of individual parcels).[1] A representative of DEM said the delayed implementation has been caused by administrative problems and lack of staffing. Despite these problems roughly 30,000 acres of inland and coastal wetlands have been restricted. Inland restrictions have been completed in fourteen towns and coastal restrictions have been completed in twenty-five towns. Less than .4% of these restrictions

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[1]Wetlands Project, Massachusetts Audobon Society.

have been resolved via court suits.

In 1967 restrictions were placed on several large coastal marshes in Quincy. DEM has indicated that these restrictions were imcomplete and need to be redone. Only three towns on the Cape have been restricted: Truro, Eastham and Orleans. Sandwich is nearly completed and Bourne is half-way through the procedure. DEM plans to begin restricting in Falmouth as soon as the assessor's data is computerized

National Flood Insurance Program

The first flood insurance act was passed in 1968. Since then the program has been considerably expanded and ammended. The program was created "in order to reduce annual flood losses through more careful planning and to provide property owners with affordable flood insurance protection."[1] Communities that join the program adopt federal building codes for flood plain zones to protect lives and property from future floodings. As a result, the federal government will spend less tax dollars on expensive emergency relief programs for flood disasters. By the year 2000, the National Flood Insurance is predicted to save the homeowner and American taxpayer more than one and a half billion dollars annually. However, the savings and effects of flood insurance are the subject of a great deal of debate.

[1]Ibid., Environmental Handbook, MACC, p.42

The Flood Insurance Program is administered by the Federal Emergency Management Administration (FEMA) in the Department of Housing and Urban Development. Originally the program just offered federally subsidized insurance, but since the government did not want to encourage damage prone development, the insurance program was integrated with a land use management plan.

A community may apply for the Flood Insurance Program after it receives a Flood Hazard Boundary Map from FEMA and after it adopts preliminary flood plain management measures. If their application is approved the community joins the Emergency Program. At this point the community begins reviewing building permits for new construction and substantial modifications in flood-prone areas to insure that they are built to minimize damage caused by a future flood.

Meanwhile the Army Corps of Engineers prepares precise maps that mark the elevation of the 100-year flood. These are called the Flood Insurance Rate Maps. They are divided into the following flood risk areas:

Zone A - Areas of 100 year flood, base flood elevations and flood hazard factors not determined.

Zone AO - Areas of 100-year shallow flooding, flood depth 1-3 feet: product of flood depth (feet) and velocity (feet per second) less than 15.

Zone A1-A30 - Areas of 100-year flood: base flood elevations and flood hazard factors determined.

Zone A99 - Areas of 100 year flood to be protected by a flood protection system under construction:

base flood elevations and flood hazard factors not determined.

Zone B - Areas between limits of 100 year flood and 500 year flood: areas of 100-year shallow flooding with depths less than 1 foot.

Zone C - Areas outside 500 year-flood.

Zone D - Areas undetermined but possible flood hazards.

Zone V - Areas of 100 year coastal flood with velocity (wave action): base flood elevations and flood hazard factors not determined.

Zone VO - Areas of 100-year shallow flooding with velocity: flood depth 1 to 3 feet: product of depth (feet) and velocity (feet per second) more than 15.

Zone V1-V30 - Areas of 100-year coastal flood with velocity (wave action) base flood elevations and flood hazard factors determined.[1]

Only in zones A, AO, A1-A30, A99, VO, and V1-V30 are communities required to implement flood plain management measures. Zone A represents the area of greatest flood hazard; Zone C represents an area of the least flood hazard; and Zone C is an area where the flood hazard has not been determined.

After a community receives a Flood Insurance Rate Map it can either appeal the boundaries to HUD or join the regular program. The Secretary of HUD decides the boundaries that have been appealed. If the community still disagrees

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[1]How to read a Flood Insurance Rate Map, by HUD

it can appeal the decision to the U.S. District Court. On the other hand if the community joins the regular program, it must adopt precise construction measures to insure that new construction and major alterations within the 100-year flood zones are flood proof. Participating towns pass zoning by-laws that require new construction satisfy standards authorized by the National Flood Insurance Act and related enactments, and/or create Flood Plain Protection Districts. In addition HUD encourages local governments to create stricter regulations than the minimum HUD guidelines or even prohibit development in flood prone areas.

Although the program is not mandatory, almost all flood-prone communities in Massachusetts have joined. Those communities that have not joined are not eligible for federal grants for new construction in any of the flood-prone areas.

Flood Plain Insurance is available from any local insurance agent in the participating communities. Rates are low because of the federal subsidy.

Dredge and Fill Permits

The Army Corps of Engineers has the longest history as a wetland regulatory agency. The Rivers and Harbors Act of 1899 gave the Corps jurisdiction over any construction in navigable waters. This jurisdiction is limited to tidal areas up to mean high tide, and in lakes and rivers that have an historical or potential use for interstate commerce.

The Corps requires a permit for discharge, filling, dredging or any other work that might affect the course, location, condition or capacity of navigable waterways.

In addition the Federal Water Pollution Control Ammendments (PL92-500, Sec. 400 as ammended by PL95-217) gave the Army Corps several responsibilities parallel to those given to the Massachusetts Conservation Commissions under the Wetlands Protection Act. Three years ago, the Corps began a mandatory permit program for the deposit of fill in virtually all waters of the United States and its adjacent wetlands except "intermittant streams, headwaters with an average flow of less than five cubic feet per second, isolated wetlands and impoundments and natural lakes under ten acres."[1]

Local Bylaws

Flood Plain Bylaws:

In order for a town to participate in the National Flood Insurance Program, it must pass zoning bylaws for construction in flood plain zones that are at least as restrictive as the standards promulgated by the Federal Emergency Management Administration. With the aid of HUD Flood Insurance Rate Maps, building inspectors in participating towns can judge whether or not flood plain buildings codes are applicable to new construction.

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[1]Ibid., Environmental Handbook, MACC, p.38

Other Bylaws:

Many conservation commissions have discovered that "the burden of enforcing the Wetlands Protection Act has been materially lightened by the passage of a local bylaw or ordinance which requires a municipal permit for work in a wetlands or flood plain."[1] State courts have upheld a local governments right to pass these bylaws.

In the case of Goldman v. Selectmen of Falmouth, 358 Mass. 519 (1970) the court held that the "state regulatory wetlands acts do not preempt local control: that is regulation of wetlands through municipal ordinance or bylaw is not inconsistent with statewide wetlands laws."[2] In a related case, Lovequist v. Gardner (case #35497), the court upheld the constitutionality of a bylaw that included not only the seven interests of the Wetlands Protection Act but also protection of wildlife, recreation, and aesthetics. Other towns have included additional features such as runoff limitations or described protected areas in terms of vegetation. These bylaws may be passed by a simple majority. As with zoning bylaws all appeals must be made directly to Superior Court.

Many towns have passed zoning and other bylaws that

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[1]Ibid., p.41
[2]Ibid.

affect construction near wetlands in a number of ways. Although Title V of the State Environmental Code requires a minimum of fifty feet between residential septic systems and wetlands, several towns have passed bylaws that require greater distances. This can effectively reduce the number of buildable lots in a town. In addition residential cluster development and subdivision controls can require that eighty to ninety percent of the proposed project be upland. Marshfield and several other coastal towns have created wetlands zoning districts with similar special guidelines for development.

CHAPTER FOUR

SURVEY RESULTS

I initially developed a list of people I wanted to interview from Quincy and Falmouth conservation commission files and from knowledge gained in my previous research. Interviewees were not selected randomly, and therefore do not represent a random sample of industry perceptions. Whenever possible I taped my interviews. I was able to do this by assuring all twenty-seven interviewees that I would keep their names and identifying information condifential unless I received their permission to do otherwise. Furthermore it should be emphasized that these interviews contain perceptions that have not been corroborated; the dollar figures in the interviews do not represent economic analysis. I have selected excerpts from these interviews that I feel best represent the opinions of the interviewees and not my own.

The interviews consisted of twenty-one questions (See Appendix D). The tape recorder was extremely useful in maintaining the flow of the interviews, keeping complete records, and understanding the subtleties of the responses. I have used these questions as a framework for analyzing the responses. The interviews from both study areas are discussed together in this chapter. In addition I have also included excerpts from interviews with the chairmen

of the Quincy and Falmouth Conservation Commissions at the end of this chapter. The next chapter discusses and analyzes the perceptions expressed in the survey.

1. TO WHAT EXTENT HAVE YOU ENCOUNTERED WETLANDS REGULATORY PROGRAMS?

Nearly every person I talked to had been involved with at least one case that went before a conservation commission. With the exception of bank mortgage offices and realtors, the phrase "wetlands regulatory programs" about ninety-five percent of the time was considered synonomous with the Wetlands Protection Act administered locally by the conservation commissions. (Details are found in Chapter 3.) Bank mortgage officers and realtors, while not unfamiliar with the program, were more likely to mention encounters with the Flood Insurance Program administered by HUD. Several builders had had experience building in the flood plain, but only one builder answered that he had encountered flood plain building regulations at this point during the interview.

Only one person, a professional engineer[1] in Falmouth, mentioned the Wetlands Restriction Program. Restrictions under this program have not yet been placed on the deeds in

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[1] A professional engineer has a civil engineering degree. He is responsible for a topographical survey of the lot, a soil examination, a percolation test, and drawing up the site plans for the house.

either Quincy or Falmouth. This same engineer also brought up the local wetlands by-laws which are becoming more prevalent in towns on Cape Cod. No one mentioned the dredge and fill permit system run by the Army Corps of Engineers.

Since the Wetlands Protection Act is the focus of this thesis, I continued the interview with a series of questions to determine their perceptions of its impact.

2. ON THE BALANCE WHEN A BUILDER OR DEVELOPER STUDIES THE FEASIBILITY OF A PROJECT WHICH IS MORE IMPORTANT LOCAL ZONING OR THE WETLANDS PROTECTION ACT?

The builders and engineers that I asked answered this question almost the same way. The Wetlands Protection Act was much more important. A representative of the Green Company[1], one of the largest developers on the Cape, simply answered "wetlands considerations are super important." A representative of Holmes and McGrath Engineering of Falmouth said that by far the Wetlands Protection Act and local wetlands bylaws had a greater impact on a feasibility study.

The general opinion was that zoning was almost a given and not subject to a case by case review. "Zoning is not subject to the type of change that can occur overnight and

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[1]The Green Company, which has its home office in Wellesley, has recently built two large condominium developments in Falmouth: Treetops and Falmouthport. In addition to Falmouth they have had experience with conservation commissions in Newton, Harwich, and Hingham.

make a piece of land a wetlands," said one builder. "Zoning is a primary threshhold, but it's a very low hurdle because it's a determination that is hard cold geography. On the other hand the conservation commission holds a very subjective review."

A representative of a builders' association on the South Shore explained it this way:

> In zoning situations, the land lies in Residence A, 15,000 square feet lots. If you have twelve acres, you subtract the room you need for the roads and then you'll end up with X number of lots on a purely mathematical basis. --Then enter the conservation commission -- Does the stream meander? How many lots does it affect? How much of the lot can't be filled or can't be altered or can't be covered or whatever? On top of that you have to take your 100 foot buffer zone. All this tends to be much more subjective. The standards are not as clear. Also in zoning, after you get a project approved you're frozen from zoning changes for five years. That's not the case under wetlands.

One developer said he submitted four plans to a south shore local planning board over a period of two years because the conservation commission failed to approve his subdivision. Finally he appealed the conservation commission's decision. After three years and $10,000 in expenses for an attorney and expert witnesses, his subdivision was finally approved. "And the only difference between the approved plan and my original plan was that they attached a conservation restriction on a small parcel that I never intended on building. The conservation commission goes way afield of what they should be involved in", he concluded.

A realtor in Falmouth said that on one piece of coastal property he recently sold, the flood plain by-law had the greatest impact. The proposed house was located in a flood plain high velocity zone. Federal regulation adopted by the town required that the first floor of the house be built above the base elevation of the 100 year flood. He believed these design constraints temporarily delayed the sale of this piece of land.

In contrast to what the builders and engineers in Falmouth expressed, a member of the local conservation commission sat in on one of my interviews with a realtor and said that zoning is overall a more important criteria in assessing the feasibility of a project. He added:

> Our local planning board is very strict about access, drainage, and various other regulatory measures. It can sometimes take a couple of years before they can even begin building a road. The local conservation commission very seldom turns something down. What we try to do is add some conditions and safeguards to insure the protection of wetlands. Only infrequently do we deny a project outright.

A south shore builder pointed out that although the Wetlands Protection Act is important, local zoning can potentially kill a project. He said that if a local planning board increased frontage requirements, widened road requirements, enlarged minimum lot sizes or generally strengthened any number of local zoning bylaws that they could render a project cost-prohibitive. "And that happens more than I can tell you", he added.

3. WHAT DID YOU DO DIFFERENTLY BECAUSE OF THE WETLANDS PROTECTION ACT THAT YOU WOULD NOT HAVE DONE OTHERWISE?

I targeted this question to reveal information about specific modifications that people made because of an Order of Conditions issued by the local conservation commission. But in their responses, some people indicated that their overall strategies or attitudes towards development in wetlands areas had also changed drastically.

The first type of response was more common. One developer on Cape Cod said that the conservation commission insisted on a non-structural remedy to a beach erosion problem. The developer had proposed building a groin but the conservation commission insisted on sand replenishment. Their rationale was that groins usually have a negative impact on beaches downstream of littoral drift. Although the developer conceded this fact, he argued to no avail that he owned the land downstream and that it should be his right to decide where the trade-offs should be made and accept the adverse consequences.

Two developers complained that they had to reduce the number of units built because of wetlands. One said, "Cutting down the numbers of lots raises the whole question of whether you can build or not. Costs have to be divided between fewer lots. If you overshoot the market you go broke. There's a high mortality rate in this business."

The other developer was building clustered condominiums and showed the same experience:

> We were cut back by a third. This affected our profit margin because all common things had to be divided by fewer units. This forced us to spend less on the common property, especially things like landscaping to make up for the loss in the number of units.

Many other modifications were not quite as drastic. Some Order of Conditions included such changes as moving a road a little farther upland to lessen the impact of runoff on the marsh. Many Orders required the use of hay bails to control erosion during construction. Another common Order of Conditions requires turfing or sodding immediately after construction to prevent erosion. (See Appendices C and D). One realtor said he had to build a boardwalk over a sand dune for access to a beach. A builder of condominiums was required to drill four ninety foot wells to see what affect sewers would have on ground water supply. And finally one builder who had appealed the local Order of Conditions and won (but suffered considerable delay) said, "essentially nothing is different from my original plan."

But some strategies and attitudes had also changed towards development in wetlands areas. For example, a south shore builder told me, "I don't buy lots outright anymore. I want a permit to build before I'll buy." He said at one time there was a lot in Quincy he was interested in purchasing. He paid an engineer for a plot plan, but

the Quincy Conservation Commission denied the permit, so he never bought the land.

4. WHAT WOULD YOU HAVE DONE IN THE ABSENCE OF THE WETLANDS PROTECTION ACT REGULATIONS?

A man who had recently subdivided a large parcel of land said that he felt riprap[1] was necessary on all the waterfront lots, "and to do it correctly, it should be done at the same time in a uniform way. Instead I'll let the new owners go and do it 'half assley' themselves. I'm too old to fuss with the conservation commission." A second developer would also have built more shoreline structures. He told me that, "in the absence of regulations, only our shoreline erosion program would be different. It would be a much more aggressive program and we would accept any adverse consequences."

An engineer said that without the Wetlands Protection Act, siltation issues would be addressed in only thirty percent of applicable cases. "The conservation commission addresses ninety percent of siltation cases in our town." He also added that without regulations a lot more marsh-land would have been filled.

Two developers who had appealed Order of Conditions

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[1]Riprap is an assemblage of broken stones erected on coastal banks for the prevention of erosion.

told me that if it was not for the regulations, both their projects would have been completed. "If that were the case", one added, "I would have had more money to put into other houses elsewhere." Both of these projects had been appealed because the developer disagreed with Order of Conditions that prohibited building on selected individual lots.

Some interesting responses were given when I asked a slight variation of this question.

5. WHAT DIDN'T YOU DO BECAUSE OF THE WETLANDS PROTECTION ACT?

Besides the corresponding answers that I received from questions 3 and 4, I heard some other curious responses:

> I had applied to HUD for a grant to experiment with roof-top solar water heaters on a large subdivision, but my plan was stuck on appeals from the Order of Conditions. In the end I not only missed the grant but they cut back on the number of houses I could build. So with fewer units, I put less into the houses to cover my costs. I was going to cut bridle paths for horses, but all that went out the window.

Another man had subdivided into roughly fifteen lots for single family homes. He added:

> I originally wanted to do condos, but they're too much of a hassle. The planning board or the conservation commission would have given me a hard time. There's another lot that I would have built on, but that's in the flood plain and it's a little wet so I gave up on that too.

Large developers seemed willing to sacrifice occasional

projects to avoid having to deal with the conservation commission in order to get approval on other more important and profitable projects. For example, one Cape developer told me that his firm had foregone building on several low-lying inland lots that were wet on rare occasions and also the option of enlarging some small sinkholes into ponds. "We have bigger fish to fry," he explained, "but I'd like somebody to tell me the ecological value of those sinkholes".

A south shore developer said that his excess costs have a direct impact on how much money he can spend on a project. "The more they steal from you because of delays, interest, or taxes," he explained, "the less money you have to put into the house or the grounds around it. Consequently you end up with less."

6. DID YOU EXPERIENCE EXTRA OR SPECIAL COSTS BECAUSE OF THE WETLANDS PROTECTION ACT THAT YOU WOULD'T HAVE EXPERIENCED OTHERWISE?

People experienced many different kinds of costs. I asked two engineers what were the special costs involved in siting a single family home. One replied that the average cost for surveying and plot plans for the normal house located on a piece of upland was $375 to $500. Plans for this same house located on a piece of land within 100 feet of wetlands would cost $1000, he said. The second engineer said the cost was probably closer to $800 but can run as high as $1000.

Siting a house near a wetlands, they explained, required extra design costs and extra engineering. The septic system must be 100 feet away from the wetlands. Generally this means burying a septic system uphill which will add $300 to construction costs. In addition, the DEQE reviewing engineer in Lakeville requires at least four feet between the bottom of the leaching component and the water table. This necessitates extra test well drilling to find the exact location of the water table. Although a homeowner can present his/her case at the hearing before the conservation commission in person, on both Cape Cod and the south shore engineers have assumed this duty because of their experience and expertise. They are generally paid additional money for this service. Filing fees and the required newspaper notice of a hearing can cost an additional $50.

"These costs have to be paid by everyone building in a wetlands," the engineer continued, "but there are a lot of uncertain costs, like delay." He estimated that the average project is delayed two months when the Wetlands Protection Act is involved. This means extra construction costs and taxes. Construction costs have been rising one percent per month recently. Delay on a $100,000 house could thus on the average cost the owner $2,000 just in waiting time.

These same delay costs can be much more expensive for

the large developer. Holding costs on land can be just as great as increases in construction costs. Mortgages on land mature much more quickly than home mortgages. Part of a developer's profit is thus dependent on turning the land over quickly. A south shore builder told me:

> I had a $400,000 loan at 8.5 percent, that works out to $90 per day or $30,000 a year just in interest, and I've been working on that project for five years. Plus I pay $10,000 a year in local taxes. If it wasn't for the conservation commission, I'd be finished by now. As it stands I'm only half built. I could only survive because of inflation and because I could funnel money down from my other project. That money paid for my problems here. Still, inflation is what saved me. But it also helps that every other builder is experiencing the same thing. The buyer has no place else to go. Still I'll never work in that town again.

Another developer told me that he spent $6,000 - $7,000 per quarter on interest charges alone on a $200,000 mortgage.

On large construction projects such as office or apartment buildings, delay can destroy a project. The O'Connell Brothers in Quincy were building a large office building adjacent to the State Street South Bank complex. The Quincy Conservation Commission approved the project, but a group of abuttors appealed the case to DEQE, citing potential drainage problems if the structure were built. A representative of the firm estimated that the delay was costing them $100,000 per month in rising construction costs and $6,000 - $7,000 per month in interest on the mortgage. After a two month delay, they compromised with the abuttors

and agreed to build a pumping station to aid the storm sewers in periods of high tides and heavy rains. He explained that they had no choice, "it was either compromise or go broke."

A real estate agent on the Cape told me about a piece of land he personally owned and sold with the condition that a building permit would be issued. The case was complicated by the fact that the house was located in a flood plain velocity zone. The sewage disposal plan alone cost him $1,250 whereas usually he said it would cost $450. In addition, he suffered six months delay with holding costs of $600 per month on an eighteen percent land mortgage. "What really hurt," he said "is land appreciates at twenty percent a year around here. I should have got ten percent more for the lot. I should have made it a flexible price."

Others experienced costs directly related to their Order of Conditions. One developer said that they spent $10,000 per year during construction on erosion and run-off control. But a Cape Cod developer said that the biggest cost to them was management time in dealing with the conservation commission and trying to develop an acceptable plan. "In any case," one interviewee added, "the relative expertise of local boards doesn't do justice to the expense the developer goes through. The Order of Conditions read like 'there will be erosion, da, da, da, and then God will come on the eighth day'."

One Falmouth builder who built single family houses said he recently lost a job because of delays. Apparently, the owner had applied to the conservation commission when mortgage rates were eleven percent. He was delayed several months by the commission but his house was finally approved with minor modifications. When he applied a second time for a mortgage, the rates had jumped to nearly sixteen percent. So he decided not to build. It should be pointed out though that in a period of falling rates, delay could actually save people money.

Oddly enough, a few people may have benefited from delay. One Cape Cod developer who subdivided a large tract of land spent several years in appeals getting his plan approved. In the end he won. Until recently his taxes were minimal, then full valuation was completed and they rose dramatically. Meanwhile the cost of land has risen faster than even inflation. It appears that the higher prices he is getting for the lots will more than cover his additional costs during development, after inflation has been netted out.

The developer or builder is not the only person who suffers the costs; many of these costs can be passed on to the new home buyer. A representative of a builder's association explained to me, "To the extent they are front costs, the developer has to carry them. Later he might be able to pass some of this on to the buyer. But that

money could have gone into the house or made the house that much cheaper." So the new homeowner shares at least part of the burden of wetlands protection.

7. IF YOU WERE EXPERIENCING DELAY ON A PROJECT, WHAT WERE YOU DOING IN THE MEANTIME?

None of the builders surveyed said that delay put them out of work. In every case, the builder was able to shift to another project during such periods. Most of the single family home builders seem to have several jobs going at one time. In one case though, a builder did lay off some employees because he was forced "to wind right down" to a skeleton crew while his case was being appealed. A representative of a south shore builders' assocation gave me a different opinion:

> The little people get creamed. The bulk of small operators can't work anymore because they don't have the money to finance the delay caused in battling all the bureaucracy, not just because of wetlands but wetlands can add to the delay.

In any case, the shift in activity is much easier for a builder of single family homes than a builder of large office or apartment buildings. Larger builders seldom have several projects going that would enable them to shift money, men, and equipment at the drop of a hat. One Quincy builder told me that if he experienced one more month of delay on his office building project that he would have been forced to fire employees. In fact he said it was a go

broke or compromise situation.

8. HOW EVEN DO YOU THINK ENFORCEMENT OF THE WETLANDS PROTECTION ACT HAS BEEN FROM PLACE TO PLACE AND OVER TIME?

Most everyone interviewed had an opinion about the differences of enforcement over time in the town in which they worked, but only a few were able to compare experiences from place to place. Perhaps the most interesting response I had to this question came from a Cape Cod engineer who I had also interviewed two years earlier as part of a related study.[1] During the first interview, the engineer said that local conservation commissions had been issuing unreasonable Order of Conditions. He felt commissions had set standards to prevent repetition of the worst experiences that their towns had had with developers. These standards were not fair or reasonable for the average builder.

During my recent interview with him, he had more positive things to say about the conservation commissions and the Wetlands Protection Act. He said:

> The system has changed since 1978. You can throw out the past history. Conservation commissions are becoming much more sophisticated. Some people used to think the law meant no building within 100 feet of a wetlands. It was abused by misunderstanding. It works better now; the delay is even reasonable. And the technical assistance from CZM (state office) has been great.

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[1] Stephen R. Cassella, The Impact of the wetlands restriction program and the wetlands protection act on residential property values in Eastham and Orleans. 1978

From his experience, enforcement had been fairly even across the towns in which he has worked recently. Again he credited the technical assistance from the state office of Coastal Zone Management.

Other people had more negative things to say about enforcement. Another engineer gave me this impression:

> Some decisions are inconsistent with the principles of democracy. A town down Cape issued an Order of Conditions that prohibited the builder from planting willow trees, because one member of the commission didn't like willows. Some towns are unbelievable. Some are lax.

I heard several stories similar to this but most were third or fourth hand with few specifics, making them difficult to verify. Still such episodes were part of people's perceptions of the program, and suggest a deep dislike of it by at least some industry people.

Another Falmouth man I talked to worked as a consultant to a land surveyor in central Massachusetts. They were working in an inland wetlands area and the consultant was surprised to discover the land surveyor's ignorance of the Wetlands Protection Act. He said, "the guy had no idea of wetlands protection, but down on the Cape we're snowed in."

One builder said that the conservation commissions are different because they interpret the act differently; each board has its own peculiarities and interests. Another developer stated an even stronger point of view:

> It's very political from town to town and person to person. Anything of a regulatory nature can be used as blackmail. We're concerned a lot about even-handedness. There's just too much politics.

I asked several builders their opinion of the various boards in the towns in which they have worked. Their labels of the different commissions were interesting. One man's labels for different commissions were: very good, okay, not so good and atrocious. A second man's labels were: lenient, anti-development, and tough. And a third said: the worst, not as bad, and most friendly. The Quincy Conservation Commission had faired very well among builders. In contrast when I asked a south shore environmentalist his opinion, he told me the Quincy Conservation Commission is "Neanderthal."

One critical factor for many developers was whether or not you lived in the town in which you were building. "Locals are dealt with easier," one man explained. A south shore builder told me that the builder's reputation was more important. He believed that conservation commissions would be much stricter with builders with a reputation of destroying wetlands.

9. HAVE YOU EVER SEEN THE WETLANDS PROTECTION ACT USED FOR OTHER PURPOSES THAN WETLANDS PROTECTION?

The most common response to this question was that the Act was being used to prevent development. I was told by several people that abuttors often use wetlands protection as an excuse to stop a project. One developer who proposed a condominium development in the early seventies related this story: The woman who abutted the land protested the development before the planning board. Despite the protests the board eventually approved the plan. This occurred around 1973-1974. Soon after the bottom fell out of the housing market, so he postponed the project. Last year he decided to subdivide for single family homes. During the intervening years the abuttor had become a member of the conservation commission. His case was delayed six months at the commission before he received a permit to build. Right or wrong, he blames the abuttor for the delay.

A realtor told me of a case recently in Falmouth where an abuttor used the Wetlands Protection Act to appeal a permit to build a house that would obstruct their view. "Without buying the land or putting up one penny they tried to prevent this guy from building his house," he said. The conservation commission did deny the permit because the septic system was within 100 feet of a wetlands.

One builder complained that a member of the conservation commission opposed a specific development for personal reasons. He claimed the commission member had spent his summers at a camp previously located at the site of the proposed development and he did not want to see the area developed. The builder explained, "the Wetlands Protection Act was used as a procedure to slow everyone down and make it more expensive." A representative of a builder's association expressed a similar belief, "they try to stretch the project out so long that it dies."

A south shore builder related this experience:

> Many people won't tell you that they're anti-development. You have to push them. I got in a heated argument with the local conservation officer and I kept at him asking him what's really bugging him. Finally he told me that the new housing brought new children which would have to go to school which would increase local taxes. They treat wetlands as if they're sacred and housing is not.

The builder continued by saying that he believed the conservation commission worked in concert with the water commissioners and the planning board to prevent new housing, "they use delay in the various agencies to make it more expensive. They don't want another house in town." A prevalent attitude, one builder added is, "we were here first and we don't want anyone else in."

In contrast with the builder's experience, a south shore environmentalist was very frank and open with me. He said that the Wetlands Protection Act was used all the

time as a no growth tool and that it was a good tool. He explained further:

> There's no doubt that it is used every day of the week to stop growth. There's no other way to get a handle on what a developer is trying to do. A neighbor says 'I don't have any control over what is happening in my area', so he uses wetlands because he doesn't like development. People are pissed about development in upland as well as wetlands areas. But remember just the protection of wetlands is worth laying down in front of the bulldozers for.

A Cape environmentalist gave me a similar response:

> I'm anti-growth, anti-development. There are enough people on the Cape. We don't want to fill up this place like a sardine box. We must preserve the fragile environment. I wish the condominium developers would just get off the Cape.

A representative of a builders association said, "that use of the Wetlands Protection Act for other than strictly wetlands protection purposes, according to the law, is a bastardization of the process."

10. DO YOU THINK THE SYSTEM OF WETLANDS PROTECTION ADMINISTERED BY THE CONSERVATION COMMISSION IS A FAIR SYSTEM?

"Which town are you talking about?", is the one response that would sum up many of the answers to this question. Several interviewees complained that the system was far too open to discretionary action and arbitrary decisions locally. One south shore builder said:

> The level of expertise and the intellectual integrity varies from town to town. Some are just outright anti-development and use the

> statute for that purpose. Others are genuinely concerned with wetlands protection and condition projects just as the statute says they are supposed to.

Many other builders agreed that expertise is the biggest problem. One cynically added that their only "expertise is in making you run around in circles".

Many builders complained that the conservation commission was too vigilant in its application of the law. "They go beyond a reasonable level of definition. You should be able to fill a gully in the middle of your property" was one builder's response. Another south shore builder added, "certainly, wetlands are absolutely necessary, but to protect a sinkhole that holds water a few days in the year as if it was a grandiose ecosystem is ridiculous."

A representative of a builders' assocation pointed out that about half of the Order of Conditions that are appealed to DEQE are modified by the agency in some way.[1] "So I think that indicates that there are commissions out there, that are far more zealous than an unemotional technical viewpoint would indicate," he added.

The Quincy people I talked to were generally happy with their conservation commission. A member of the local

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[1]This is an accurate statement but some modifications are minor and some are actually stricter than the local Order of Conditions.

builders association had this to say:

> Nobody on our board has ever made a complaint about the acts of our conservation commission. They have their differences and they are resolved, but ultimately, not one of our people has found fault with the Quincy Conservation Commission. They don't always get their way but it's resolved amicably. But there are alot of towns on the south shore they are not happy with.

In contrast to Falmouth and other towns, Quincy builders felt that the level of expertise was more than adequate on their local conservation commission. This may be an accurate perception or a reflection of their satisfaction with the local level of enforcement.

In contrast, the Falmouth people I interviewed were generally unhappy with their town's conservation commission. Again, lack of expertise was cited as the biggest problem. One realtor said the commission is full of good intentioned people, but they need a professional manager. An engineer complained that the commission never understood the seven interests of the Act and therefore interfered in cases where it had no jurisdiction. Several others said that decisions were often political or made for personal reasons or grudges.

11. WHAT OTHER WETLANDS PROTECTION PROGRAMS HAVE YOU ENCOUNTERED?

Federal Flood Plain Insurance Program

The Flood Insurance Program was the most common program besides the Wetlands Protection Act that my

interviewees had encountered. Most people had very few complaints about Flood Insurance. A banker said that at first a few difficulties arose over interpretation but "they were ironed out and the program has run smoothly ever since."

Some of the harshest critics of the Wetlands Protection Act had positive things to say about the Flood Insurance Program. One realtor went as far as to say that he felt the Army Corps of Engineers should map out the wetlands for the conservation commission. An engineer suggested that the wetlands be incorporated into zoning in a similar manner as the flood plain. (Marshfield and several other coastal towns have already created wetlands zones.)

I did receive two complaints about Flood Plain Insurance. The first complaint was concerned with the restrictions on the height of the first floor. One builder said he would have liked a basement in his home and a realtor complained that the height restrictions made a house look like a giraffe. In contrast, a broker for several lots in the flood plain thought the restrictions actually enhanced the value of the new homes. "The higher you are, the better the view in this area," was his response.

The second complaint came from a Falmouth realtor who found flood insurance more bothersome than the Wetlands

Protection Act. "I've seen people turn away from buying a house because of flood insurance," he said. "It makes it too difficult to improve an old house, as well as build a new one."

Local Bylaws

Local wetlands bylaws were the next most common wetlands regulation encountered. Many of the interviewees on the Cape were confused about how they differed from the Wetlands Protection Act, but were aware of their existence. One engineer on Cape Cod who was more knowledgeable and who had been before the conservation commission several times said that, "rather than get the changes they want in the Wetlands Protection Act, they (local citizens) went to town meetings instead and got a local bylaw. They don't realize the nickel and dime implications. They've adopted the bylaw without looking at its impact." A Cape Cod engineer added, "wetlands protection is like mom, apple pie, and the American flag. Town meetings have been more than willing to adopt wetlands bylaws" without reviewing the consequences.

A representative of a builders' association said that the wetlands bylaws are the biggest concern builders and developers have about wetlands protection. The local bylaws are not constrained to include only the seven interests of the Wetlands Protection Act. The court case Lovequist vs. Gardner upheld the constitutionality of a

bylaw that included not only the seven interests of the Wetlands Protection Act but also protection of wildlife, recreation, and aesthetics. What bothers builders is that a town bylaw can have any criteria a town wants and any administrative process. Furthermore, an appeal to a bylaw decision must go straight to court. The Chairman of the Falmouth Conservation Commission, an attorney, said that it could take up to three years to hear a case in Barnstable County. One Cape Cod builder described a cookbook recipe for how to make a bylaw:

> What they do is parrot the Wetlands Protection Act, add a few additional criteria to the seven interests of the act, and then just cross out the appeal to DEQE.

A representative of a builders' association continued the argument against the additional criteria:

> And aesthetics? What looks good to you may not look good to me. This is begging for an arbitrary decision. Wildlife? What is it, fur bearing wildlife, marine, lizard, fish, endangered species, or any wildlife? I've seen no definitions. If you disturb a squirrel's nest does that constitute a violation? The developer has no set standards on which to judge whether he is abiding by the law or not.

Builders think that lack of an adequate appeal process is one of the bylaw's most disturbing features. It translates into additional delay and high legal costs. One estimate was that an appeal to DEQE would take up to six months and cost $1,000-$2,000, whereas a court case might take up to two years and cost $5,000-$10,000. On top of

that must be added the holding costs and the inflationary increases in construction costs that I discussed earlier. In addition builders would prefer to deal with an agency with expertise in engineering such as DEQE than with a judge who may have to make the decision on a different set of factors. An engineer on the Cape said that the conservation commissions never understood the Wetlands Protection Act and the seven interests of the Act and "that's why they want bylaws, to avoid the appeal."

Wetlands Restrictions

Although the Inlands Wetlands Restriction Act and the Coastal Wetlands Restriction Act were passed in the late sixties, only a few coastal restrictions have been placed on deeds in Quincy and none have been placed in Falmouth. Nonetheless, a few builders had observations and opinions about the Restriction Program. A developer in North Falmouth said that restrictions were "unfair without compensation."

Some of my previous research[1] had led me to believe that a builder would prefer the certainty of an absolute restriction rather than the uncertainties with the Wetlands Protection Act. One interviewee explained to me that restrictions work great from the prospective framework if you have not bought the land yet:

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[1]Ibid., Cassella, Eastham and Orleans.

> You know before you put your dough down that a piece of land has X amount of acres that you can't go near or you can't fill or whatever. You make your decision on whether to buy or not to buy, how much to offer, and what the land is really worth, your ultimate lot yield. That's the builder's personal feasibility study before he makes the committment.

Noone would buy a piece of land that they had reason to believe would be worthless because of wetlands restrictions. But retroactively, when it applies to a piece of land that is just not developed you can destroy an individual's investment. He continued to explain why:

> So you get guys who have been holding this land, some for a long time, some for a short time who now experience a change in the rules of the game, so to speak, and are locked in. They have tens of thousands of dollars in options, or they own the land outright, or they got mortgage committments to a bank, and all of a sudden a restriction on the land has just gobbled up 7/8 of it or a half or whatever. That makes a mess of any feasibility study particularly when you figure the market will bear houses of a certain value, lots of a certain size. By throwing one of these factors out the whole feasiblity of the project is thrown into question.

Another interviewee complained that the state initiative to restrict land was devoid of concrete standards of what constitutes a validly restrictable wetlands or how environmentally important the wetlands has to be in order to be subject to a restriction. "Restriction," he said, "can render the land useless. This is a taking and denial of due process."

Other Regulatory Programs

Contact with other wetlands use regulatory programs was minimal. Two builders had encountered the Army Corps

of Engineers dredge and fill permits and both expressed the feeling that these "safeguards are necessary and wise". One developer had experience with the state's Scenic Rivers Program. Although he said he had no problems with the program, I knew he had a reputation for opposing it. At that time his plan to expand his development was under severe attack from the Department of Environmental Management (DEM) and local citizens; perhaps the Scenic Rivers Program was temporarily the least of his worries.

12. DO YOU KNOW OF PROJECTS MOVED TO INLAND SITES OR CANCELLED BECAUSE OF REAL OR FEARED PROBLEMS WITH WETLANDS REGULATIONS?

An engineer on the Cape said he believed at least five percent of all people building new homes near a wetlands move the house beyond 100 feet to avoid delay and delay costs related to the Wetlands Protection Act. "If they have to appeal," he said, "it could be seven months before they could start building which translates into seven percent increase in construction costs alone." A realtor added that developers have moved roads away from marshes for the same reasons.

Two projects I mentioned earlier were claimed to have been cancelled because of the Wetlands Protection Act, one because of real problems and a second because of feared problems. The first was a single family home. The

owner applied to the conservation commission when mortgage rates were eleven percent and was delayed several months. Finally when his house was approved with minor modifications, he cancelled the project because interest on mortgages had jumped to nearly sixteen percent. The second story was related to me by a Cape Cod developer. He said he had foregone building on several low lying inland lots that were wet on rare occasions. "We have bigger fish to fry", (See page 54), he explained, implying he wanted to save the energy and time he expended on the conservation commission for more important projects.

Interviewees claimed that both the Pyramid Mall in Kingston, and a shopping center in North Attleboro had been cancelled because of complications with wetlands regulations. Unfortunately I was not able to corroborate this information.

Finally, a developer on the Cape said that the wetlands regulations were partly responsible for modification of his original plan to build garden-style condominiums. Although he did not move or cancel the project, he switched to single family homes because he anticipated single family homes would meet with less resistance at the planning board as well as the conservation commission.

13. HAVE YOU SHIFTED YOUR ACTIVITY AWAY FROM WETLANDS AREAS TO AVOID DEALING WITH WETLANDS REGULATIONS?

The answer to this question was an overwhelming no! One interviewee said, "I'll buy another piece of waterfront property as fast as I can find it." Another realtor added, "most people would give their shirt to buy waterfront property regardless of regulations."

On the other hand an engineer mentioned that he knew of a developer who would not buy flood plain property on speculation. A realtor who expressed the same reluctance explained the reason: "Alot of people do not want to buy a godforsaken house. They'd have to build a crazy looking house, an eyesore even though the price may be good." He added that flood insurance depreciates the value of shoreline real estate because regulations make houses look like "giraffes".

14. DO YOU THINK PROTECTIVE REGULATIONS ON WETLANDS USE INFLUENCE THE VALUE OF WETLANDS PROPERTY?

This question proved to be difficult to answer. A realtor responded, "How do you put a dollar value on the scenic value of wetlands?" Immediately I thought of a billboard on the lower Cape that advertised "Houses with Marsh View". Another person told me I would have to figure out how much the land would be worth filled and compare it to how productive the land was as marsh.

The general attitude was that protective regulations

decrease the market value of the wetlands itself, but increase the value of abutting land. "If a buyer knows his view is protected," one realtor said, "he'll pay more for the property." In essence the protective restriction increases the privacy of the lot owner. On the other hand the realtor who was reluctant to sell homes in the flood plain felt that all flood plain property has lessened in value because of the building regulations which forced construction of houses with a giraffe appearance (see Question Thirteen).

15. DO YOU THINK PATTERNS OF DEVELOPMENT NEAR WETLANDS HAVE CHANGED BECAUSE OF LOCAL, STATE, OR FEDERAL REGULATIONS?

One Falmouth interviewee thought that wetlands regulations have had very little impact on the broad patterns of development. "People still want to get as close as possible to the water's edge," he explained, "The edge only has changed. Now it is 100 feet farther back." This was the shared view of most of my interviewees. Either people moved their houses farther back to minimize their problems with the conservation commissions or they moved all construction outside the 100 foot border to be completely outside its jurisdiction.

In addition a developer said that developers haven't stopped buying wetlands but have instead designed projects

that encounter the least resistance with regulatory authorities. An engineer agreed with this statement saying that "developers are taking greater steps to preserve wetlands just to avoid the hassle with the conservation commission." This reminded me of the realtor who commented that he recently noticed new development with roads farther from the marsh.

A few others mentioned they had seen changes in the actual design of housing. "sure, they're putting houses on pilings to conform with Flood Plain Insurance," a builder in North Falmouth pointed out. But this change in design was exclusively related to housing built in the flood plain.

I pursued an additional line of questioning to see whether they thought wetlands regulations had encouraged cluster developments. One interviewee told me that the two are "not connected at all. They should be but they are not. For most people it conjures up ideas of high density and multi-family. They (environmentalists) don't seem to realize that you are creating green space around and high density within." He felt that cluster developments were more appealing to "legitimate conservation commissions." An engineer added that "cluster devlopment was coming because of conservation of energy", but not because of wetlands regulations.

Although one of the environmentalists I talked to had positive feelings for cluster developments, a second was adamantly opposed. "I hate cluster zoning," she said. "It brings in too much of everything that I just don't want to see....I wish these condominium developers would just get off the Cape."

16. I WOULD LIKE YOU TO TELL ME HOW STRONGLY YOU AGREE OR DISAGREE WITH THIS STATEMENT ON A SCALE FROM 1 - 5: PROTECTIVE LAWS OR REGULATIONS, FEDERAL, STATE, OR LOCAL, ARE NECESSARY TO PRESERVE THE WETLANDS ENVIRONMENT. (1 is strongly agree, 5 is strongly disagree)

Every interviewee agreed that protective laws and regulations were necessary. Most picked #2 on the scale and a few picked #1. One developer said that the laws were needed because of all the abuses in the past which had "spoiled alot of good property." Another developer added that there is "no question that a wetlands area should be protected, provided it was a legitimate wetlands". He defined a wetlands as "an area that is wet at least six months of the year."

This same problem of definition popped up over and over throughout my interviews. People would accept protection of wetlands as long as it was a definitive term. As the south shore builder (see Question Ten) as well as many others pointed out, treating a sink hole as "a grandiose ecosystem is ridiculous." My interviews said

that a major change needed in the program was the need for more clearly defined terms.

17. SHOULD THE FILLING OF WETLANDS BE PROHIBITED: IF NO UNDER WHAT CIRCUMSTANCES SHOULD FILLING BE PERMITTED?

I ran into the same problem with the definition of a wetlands on this question that I did on the last one. The typical response was positive with "a definitive term, wetlands, but not a piece that was dry eleven months of the year." Noone endorsed an absolute prohibition of filling, although one person felt there should be a ban on filling "if it's just for the sake of creating upland."

A Cape Cod realtor suggested filling be allowed "if you need to fill a small piece to round off a lot so that you can build." A south shore developer also approved of filling in certain circumstances. He was in the midst of proposing a project where he would have to fill a "non-productive marsh." In exchange he wanted to build a new marsh elsewhere that he believed would be more useful for storm damage prevention, flood control, and fisheries protection. And another builder felt that certain wetlands such as swamps or small holes" would be better filled.

In Quincy, the State Street South bank complex was built on a marsh that was filled in the late sixties. "Building that complex upgraded the character of that

piece of land," one builder said. "Not only is it a monument in North Quincy but it provides lots of jobs and tremendous tax revenues." The builder approved of filling in this case because the huge benefits to the City of Quincy outweighed any losses in flood protection, storm damage prevention, and protection of fisheries. A former mayor of Quincy told me:

> Before we filled the marsh, there were only six or seven businesses, $25,000 in taxes, and 100 people involved. Then all that area was filled in. State Street came in and built a 40 million dollar computer building. Kemper came across the street and built a 10 million dollar building. Now those two companies alone employ in excess of 4,000 people and they pay 4 million dollars in taxes. And now two more buildings are going up. All that land is going to produce now is taxes and jobs, and that's what a city needs to survive. The tradeoffs were well worth it.

In general most developers expressed recognition of the environmental values of wetlands protection. Some also mentioned the aesthetic value. However, many felt that "because of the nebulous definition of wetlands" that this was a difficult question to answer.

18. AT WHICH LEVEL OR COMBINATION OF LEVELS OF GOVERNMENT DO YOU THINK THE BEST PROGRAM OF WETLANDS REGULATIONS CAN BE RUN: LOCAL, STATE OR FEDERAL?

Despite all the complaints about local conservation commissions, nearly everyone I talked to felt that a locally managed system of wetlands use regulations with state overview was best. Although some interviewees agreed

to local control reluctantly, most felt that local knowledge and customs were superior. Only two interviewees argued that exclusive regional or state control was preferable. One of them said regional control was necessary to take control away from "small towns where people are related and can stop projects and growth."

It was surprising to me how many people endorsed the present system. One interviewee explained:

> I frankly think the way it is set up now is pretty good. Presumably if you get a reasonable developer, a reasonable conservation commission, and a reasonable design, you'll get approved at the local level. If that's not the case the law provides for an appeal. That's good too because it removes the process from the local growth - no-growth atmostphere.

What was important to most interviewees was the existence of an appeal process for local Order of Conditions. Although they felt local management was best, they wanted a system of checks and balances to prevent treatment they considered unfair by 'overzealous' conservation commissions.

19. CURRENTLY IN MASSACHUSETTS THE SAME RULES AND REGULATIONS APPLY TO INDIVIDUAL PROPERTY OWNERS BUILDING HOMES OR MODIFYING EXISTING PROPERTIES AS TO DEVELOPERS BUILDING NEW HOMES FOR THE SPECULATION MARKET. DO YOU THINK THIS IS HOW IT SHOULD BE?

Virtually everyone said that the rules and regulations should be the same for both individual property owners and developers. One interviewee said, "Why should it be different if as a developer I do something and as a

homebuilder at my own house I do something different? It's only fair play that it should be the same." An engineer added that "there is a lack of enforcement overall. A developer's project is watched carefully whereas John Q. Public is out there getting away with all kinds of things... What's good for the goose is good for the gander." One interviewee who recently subdivided a large tract of land gave a different response. He said that he was inclined to be a little lenient with the single lot owner and not with a developer.

When I asked this same question to a Cape environmentalist the interviewee responded, "I think both regulations should be just as strict as I am. I don't think you should be allowed to cut a tree down without permission." Most of the people I interviewed, however, were vehemently opposed to so extreme a view.

20. IN AN IDEAL WORLD WHO DO YOU THINK WOULD MAKE THE BEST OWNER OF WETLANDS? A. Private Property Owner; B. Conservation Trusts; C. Town; D. State; E. Federal Government

This question was asked in order to compare the responses to the property-owner questionaire done earlier.[1] Because

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[1]This research was done at Woods Hole Oceanographic Institution under the supervision of Dr. Thomas M. Leschine of the Marine Policy and Ocean Management Department.

the interviewees were land entrepreneurs, I expected they would prefer the private property owner. But to my surprise this was not the case. Only one interviewee chose private ownership. The rest of the responses were evenly spread between the conservation trusts, the town, and the state. One interviewee argued that if the government really thought wetlands were as valuable as the Wetlands Protection Act indicates, then government (local, state, or federal) should buy the wetlands. "All we've done," he said, "is create different levels of bureaucracy to protect and restrict wetlands. It would be cheaper in the long run to go out and acquire the wetlands."

21. WHAT CHANGES WOULD YOU MAKE IN THE PRESENT SYSTEM OF WETLANDS USE REGULATION?

I received three types of responses to this question: 1) modifications of the Wetlands Protection Act; 2) elimination of local wetlands bylaws; and 3) new models of wetlands use regulation.

Overwhelmingly interviewees preferred the Wetlands Protection Act with modifications made statewide by DEQE. These suggested modifications were aimed at shortening the delay inherent in the present program administered by the conservation commissions. For many delay was the most expensive by-product of wetlands protection. Interviewees chose the present model of wetlands use regulation over

other models because, as one man put it, "it considers all the impacts of a project on a case by case basis rather than saying that everything in a specific area must be protected."

I heard two complaints about the present system over and over again: 1) the lack of expertise on the conservation commissions; and 2) the absence of clear definitions of wetlands resource areas and Order of Conditions options.

The most common complaint was the lack of expertise on the local commissions. In addition the frequent turnover of commission members (who are unpaid volunteers) was thought only to exacerbate the problem because it made training a continuous process. Interviewees often complained that they did not know what to expect from project to project and from town to town. A representative of a builders' association suggested that DEQE set up criteria to insure that different interests be represented on the conservation commissions. For example he said every commission should include an engineer, an environmentalist, a lawyer, a botanist, a builder, and an interested citizen representing the general public. He added, "this would improve the quality of Order of Conditions and allow everyone to feel they got a shot at it. Presently, because of the amount of time people have to spend, you tend to get zealots of a particular point of view."

Second, interviewees wanted stricter definitions of wetlands resource areas and Order of Conditions options.

As one engineer put it, "absolute prohibitions and definitions are necessary to prevent the conservation commission from overstepping its bounds." These guidelines would be helpful in solving the discontinuity of membership problems, as well as eliminating the gray areas that caused differences in interpretation.

Although many interviewees endorsed the provisions of the Wetlands Protection Act, those who had contact with local bylaws were vehemently opposed to them. They objected to the local bylaws because they are not constrained to include only the seven interests of the Wetlands Protection Act. (A bylaw can include any criteria such as aesthetics, protection of wildlife, and recreation, that is approved by a majority at a town meeting.) Furthermore the most disturbing feature to builders is the lack of an adequate appeal process.

In addition to these other responses three interviewees recommended different models of wetlands use regulation. One engineer suggested that wetlands be incorporated into local zoning. He was concerned that the conservation commission was just an extra layer of bureaucracy compounding delay and expense. He felt zoning was also better than local by-laws because "zoning tends to be less arbitrary. It is based on case law mystique where all uses in the same zone are treated equally." The planning board would have jurisdiction, and appeals could be handled by the Board

of Appeals.

The second model came from a builder who suggested that the conservation commission system be abandoned. He wanted to replace it with a system where complainants would file abuses. Heavy penalties and sanctions would discourage violations. At the same time delay costs would be minimal because a builder could avoid the prolonged review and appeal process.

The third model was recommended by a larger developer who felt that Massachusetts should imitate the Oregon program of wetlands use regulation. "The Oregon program is positive," he explained, "it describes what you can do. The Massachusetts program on the other hand is negative; it tells you what you can't do." He complained that the conservation commission system is based on theory that any alteration is bad. "The earth itself is not benign," he said, "all you have to do is look at the volcanic era. The theory that all change is bad is ridiculous and a very poor political strategy."

Conservation Commission Chairmen

I thought it would be interesting to see how members of the two conservation commissions reacted to some of these questions, so I interviewed the chairmen of the Quincy and Falmouth Commissions. Although they gave me their opinions as individuals and not as spokesmen for the commissions, I think they provided some insightful commentary.

First I asked James Donahue, Chairman of the Quincy Conservation Commission to offer an explanation why my interviewees had generally positive remarks about the Quincy Commission. He responded:

> I have a feeling that a lot of Conservation Commissions tend to get into things not related to Chapter 131 Section 40 and they get involved with air pollution, noise pollution, zoning, and all the things that make a town a town and a city a city. (Pause) And that's good, but my own and I think the feeling of the Commission is, we just concern ourselves with Cahpter 131 Section 40 as such, and we have tunnel vision...that's all we look at. There are times when certain housing or zoning issues, such as snob zoning come up... but these are things we don't concern ourselves with.

Mr. Donahue said that he had heard that wetlands have been used as an anti-development tool in some towns but that he felt this was an illegitimate use of the legislation.

He indicated that the wide representation of interests on the Quincy Conservation Commission would make it difficult to issue an anti-development Order of Conditions.

I asked him about the North Quincy marsh that had been filled in the late sixties to make way for the MBTA extension, the State Street South complex, Kemper Insurance, and two new office buildings (see Chapter Four, Question Seventeen). Mr. Donahue said that if an application were filed today for the filling of the marsh, it would be denied. Neither jobs nor taxes is more important than wetlands protection in his opinion. He said, "they could build it elsewhere, where it didn't interfere with wetlands," even if the new location was outside of Quincy. He told me that the only time that the Quincy Conservation Commission would allow filling is when there were no adverse impacts on the seven interests of the Act. Finally when I asked him what changes he would make in the Wetlands Protection Act, he responded, "I can't really see any."

Peter Perpall, chairman of the Falmouth Conservation Commission expressed a similar view to Mr. Donahue's on the subject of filling. He felt that neither jobs nor housing is more important than wetlands protection and that suitable sites existed inland. He said that filling was permissible in land locked sinkholes but in most other circumstances would have a negative effect on the seven interests of the Act.

Mr. Perpall expressed the belief that the Falmouth Commission was at times lacking in expertise. He said, "every time there is an application the town can't afford an ichthyologist or a marine biologist." He pointed out that DEQE has a technical staff that is better equipped to deal with scientific disputes. When I expressed the recommendation of the builders' assocation representative that various interest groups be represented on the Commission, he responded:

> That's what we have by the way, we have sort of across the board type of thing. We do not have an engineer and we do not have somebody from the construction trades, although inadvertently we have people who have built their own houses.

Presently, the criteria Falmouth Selectmen use to appoint a conservation commission member is to choose one resident from each of the seven districts in town.

Mr. Perpall said he has seen other conservation commissions use the Wetlands Protection Act as a no growth tool, but that this was an abuse of the Act. On the Falmouth Conservation Commission he said "some members tend to be a little stronger against the developer than the individual homeowner. I don't think it's right and I have expressed that opinion several times," but he also said the Act had never been used to stop development in Falmouth.

Falmouth has a wetlands bylaw that protects wildlife, aesthetics, and recreational values in addition to the seven interests of the Wetlands Protection Act. Mr. Perpall

felt the bylaw was a better alternative than the Wetlands Protection Act because the applicant could appeal directly to Superior Court instead of going through the DEQE appeal process and then have to appeal to Superior Court. Mr. Perpall, an attorney, told me that it could take up to three years to hear a case in Barnstable County.

Mr. Perpall agreed with the complaint made by many developers and builders that the seven tests of the Wetlands Protection Act were very vague. "I'd like to be able to hang your hat on something," he said, "it ought to be more specific.

It was interesting to me to compare the outlooks and interpretations of the two chairmen even though their opinions do not necessarily represent the Commissions as a whole. Both men expressed strong commitments to wetlands protection and were aware of legitimate and illegitimate uses of the Wetlands Protection Act. However, Mr. Donahue found the present wetlands regulatory system acceptable, whereas Mr. Perpall saw a need for stricter and better defined regulatory procedures. Although Mr. Perpall agreed in principle with the need for representation of all interest groups on the Commission, he did not seem to think builders and developers were inadequately represented on the present Falmouth Commission.

CHAPTER FIVE

DISCUSSION, ANALYSIS, AND COMPARISON

This chapter contains two sections. The first section discusses and analyzes the seven central themes that emerged in the survey of developers, etc. The second section contains a preliminary comparison of the survey of developers that has been completed for this thesis with a survey of one hundred wetlands property owners done in 1979.[1] In this section I highlight the similarities and differences between the two surveys.

Section I

Discussion and Analysis

Seven central themes emerged in the survey of developers, etc. They are:

1. acceptance of wetlands protection
2. opposition to local wetlands bylaws
3. the problem of uncertainty and delay
4. the no-growth, anti-development strategy
5. perceived differences in conservation commissions
6. changing development patterns in wetland areas
7. perception that the public is the best owner of wetlands.

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[1]Ibid., Leschine and Cassella, "Wetlands Regulations."

Acceptance of Wetlands Protection

My survey revealed wide support for the principle of wetlands protection. Not a single interviewee argued that Massachusetts would be better off without protective wetlands laws. Furthermore, there was wide acceptance of the present state-local partnership in wetlands protection. Interviewees felt that local knowledge and customs were superior for direct control of the program, but that a state agency with wetlands expertise was necessary to establish guidelines and to administer an appeal process.

From the interviews one would think that developers and builders were constantly suffering because of wetlands protection. This perception is somewhat contradicted by other responses in the survey. The developer's and builder's willingness to continue buying wetlands 'as fast as they can find it', is an indication of the relative importance of this suffering. What the survey probably reveals is a cummulative experience over a number of years.

In addition this impression of suffering is not supported by the statistics; an examination of conservation commission records revealed that most cases are concluded successfully at the local level. A representative of DEQE at the Boston office told me that in any given year roughly 9 percent of all Order of Conditions are appealed to the DEQE regional offices. Of these appeals approximately 50 percent are made by the applicant, 40 percent are made by an abuttor, ten local residents, or an aggrieved person, and

10 percent are requested by DEQE. About 80 percent of these appeals are settled at the regional office. Most of the remaining appeals are settled at a prehearing conference. Only 2 to 3 percent of all Order of Conditions reach the adjudicatory hearing stage. Finally only two cases on the average are actually appealed to the Superior Court each year.

Appeals in Falmouth approximately reflect the statewide averages. In 1979 six appeals of Falmouth Order of Conditions were made to the DEQE regional office in Lakeville. A representative of that office said that all these appeals were resolved by a Superseding Order and that as long as he can remember no Falmouth case has ever gone to Superior Court.[1] In contrast Quincy has had only five appeals since the Quincy Conservation Commission began hearing cases in 1973.[2]

Opposition to Local Wetlands Bylaws

Although wide support existed for the Wetlands Protection Act, interviewees who had contact with local wetlands bylaws were vehemently opposed to them for three reasons:

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[1]Chris Tilden, DEQE Southeast Regional Office, Lakeville, MA.

[2]Ray Marino of the DEQE Northeast Regional Office said it would be extremely difficult to find out how many Quincy appeals had been resolved by Superseding Orders because files prior to December 1979 had been moved to different locations for storage.

1) an inadequate appeal process; 2) lack of standards and definitions; and 3) bylaws were passed with no sense of the economic implications.

First, several interviewees said that the inadequate appeal process was the primary reason they opposed the wetlands bylaws. An appeal to a bylaw had to go directly to Superior Court which could take several years. They considered this type of delay tantamount to a denial of the project. Furthermore, they preferred appealing a local decision to an agency with wetlands expertise, than to a judge who must make a decision on a different set of factors.

Second, builders and developers complained that there were no set of standards on which to judge whether they were abiding by the law or not. They felt that regulating aesthetics without standards or guidelines was begging for an arbitrary decision. In addition they believed protection of wildlife lacked definition: "If you disturb a squirrel's nest does that constitute a violation?" They said this lack of definition translated into additional delay and high legal costs.

Third, they felt town meetings have adopted bylaws without looking at the economic consequences. They said that wetlands protection was such a popular cause that it was relatively easy to obtain a simple majority at a town meeting to pass a bylaw witout reviewing "nickel and dime

implications."

The Problem of Uncertainty and Delay

Much criticism focused on the uncertainty of the process established by the Wetlands Protection Act, not just the uncertainty of delay but also the uncertainty of restrictions and modifications contained in the Order of Conditions. Several interviewees complained that they did not know what to expect from town to town and from one case to the next; this was especially apparent in how south shore interviewees' opinions of the Quincy Conservation Commission contrasted from Cape Cod interviewees' opinions of the Falmouth Conservation Commission. They also complained that the program was devoid of set standards and clear definitions of what constituted an environmentally valuable wetlands. In their view it was difficult to tell how many lots would be affected by a meandering stream or a piece of marsh that was wet one month of the year. They felt the lack of definition in the Wetlands Protection Act resulted in a more subjective review by local conservation commissions. Furthermore, many expressed the belief that conservation commissions lacked the expertise nessary to evaluate projects; this problem was exacerbated by a constant turnover in membership of the all-volunteer commissions.

Builders felt uncertainty was compounded by the threat of delay in the approval process. Holding costs on land

included interest on mortgages, taxes, increased construction costs, and opportunity costs. Developers and builders related incidences where they suffered substantial losses because of delay.

But the economics of this situation are not that clear. Despite all the complaints people are still making money building in wetland areas, indicated by their willingness to continue purchasing wetlands property 'as soon as they can find it'. The opportunity costs must not be great enough to discourage building. So the potential profit perhaps offsets the cost of conservation commission delay and associated wetlands regulatory problems.

There are two economic models that explain what is happening; either:

1) the profit margin on land is sufficiently great that the developer can absorb the costs; or

2) the demand for wetlands property is so great that the developer can pass on the costs to the housing consumer.

One of these two models explains the situation because if the developer was really losing money they would not go back into wetlands areas to build. However, this does not mean that the developer does not perceive these costs as losses, but that ultimately the selling price will rise sufficiently to at least cover all costs.

My survey also revealed that the small builder may have difficulty bearing large holding costs and therefore avoids

speculative projects. Further research might address this hypothesis.

The No-Growth, Anti-Development Strategy

Several interviewees related experiences (personal or second hand) where they felt the Wetlands Protection Act had been used to stop development for reasons other than wetlands protection. A south shore builder said that many commission members he had encountered were anti-development but "you have to push them" or they will not admit it. Another interviewee claimed that there was a conscious strategy to stretch a "project out so long that it dies." A more charitable interpretation of this type of experience is that those commission members were not fully aware of the impacts of delay and costs of wetlands regulations. In contrast, a south shore environmentalist expressed the belief that the Wetlands Protection Act was a good tool for stopping development and used every day of the week for that purpose, which suggests that sometimes it is a conscious strategy. This type of use of wetlands regulations may contribute to the current volatility of the wetlands protection issue.

In addition trends in housing starts in both Falmouth

and Quincy appear to be linked to regional and national fluctuations but little else. The only dramatic decline in Quincy and Falmouth housing starts in the past ten years coincided with the 1974-75 building recession (see Appendices A and B). In addition my survey turned up little hard evidence that would support the hypothesis that wetlands regulatory laws were being used to restrice overall growth in the housing industry in Quincy and Falmouth.

Perceived Differences in Conservation Commissions

Overall the people I interviewed gave me generally contrasting opinions of the Quincy and Falmouth Conservation Commissions. For the most part builders, developers, etc. in Quincy said favorable things about their Commission. Their attitude was typified by the comment made by the builders' association representative (see Chapter Four, Question Ten) who found the Quincy Conservation Commission fair and reasonable, in contrast to many other south shore towns.[1] Many of the interviewees said that expertise was the biggest problem with most conservation commissions, but they felt that expertise on the Quincy Commission was not a problem. It should be pointed out again that this may be an accurate perception or a reflection of their satisfaction

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[1]Quincy interviewees tended to have had experiences with several conservation commissions. In contrast Cape Cod interviewees (with two exceptions) generally had experiences with only one or two commissions.

with the local level of enforcement. In any case I decided to check on the backgrounds of Commission members. Presently the Commission consists of only five people. It appears that there are other people willing to serve but the mayor of Quincy has not had time to appoint them.[1] The occupations of these five people are: sanitary engineer, manufacturing engineer, a Ph.d. chemist, a building contractor, and a school teacher. A representative of a builders' association had suggested that all commissions have an engineer and a representative of the building trades in addition to environmentalist representation. Perhaps a wider range of interests in the Quincy Conservation Commission improved the quality of the Order of Conditions.

Falmouth interviewees were generally unhappy with their conservation commission. The lack of expertise was cited as the biggest problem. Again I investigated the backgrounds of individual members and found: two attorneys, a housewife, a biologist, a boatyard operator and an employee of the National Marine Fisheries Service[2] but no one representing either the engineering profession or the construction trades.

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[1]This was told to me during the James Donahue interview.
[2]I did not learn the occupation of one member.

Changing Development Patterns in Wetland Areas

One of the intentions of the Wetlands Protection Act was to encourage development inland instead of at the edge of the environmentally fragile wetlands resources. From my survey it appears that the broad patterns of development have not changed very much; developers and builders have not stopped buying wetlands property. A strong demand remains to build as close as possible to wetlands resource areas despite the regulatory problems and extra costs. But there is some evidence to support that a developer's overall design tries to minimize or totally avoid delay and costs associated with conservation commission hearings and wetlands regulations. One interviewee remarked that the wetlands edge is now one hundred feet further inland. This implies that the system is working as planned.

There is other evidence that suggests strategies of investment in wetlands areas are also changing. One south shore builder said that he would not buy a piece of wetlands property without a promissory statement that guaranteed he would be able to build on the lot. This indicates a reluctance to absorb the risk and uncertainty of being able to build on wetlands property, thus forcing the seller to absorb the risk.

Perception that the Public is the Best Owner of Wetlands

Since my interviewees were land entrepreneurs I

expected them to prefer the private property owner as the best proprietor of wetlands. But to my surprise only one interviewee chose private ownership. The rest of the responses were evenly spread among the conservation trusts, the town, and the state. However, I think this perception expressed the belief that developers and builders found the wetlands regulatory system to be a tremendous inconvenience, and that if government really felt wetlands had substantial environmental value, then they should purchase them. One interviewee argued that it would be cheaper in the long run to buy all wetlands than to pay year after year for the wetlands regulatory bureaucracy.

Section II

Comparison of the Two Surveys

During the summer and early fall of 1979 I worked on a research project[1] that investigated the process and effect of wetlands regulations at the cummunity level in Massachusetts. The major focus of our research was a wetlands property owner survey in two coastal Massachusetts towns that gathered information of several types, outlined as follows:

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[1]Ibid., Leschine and Cassella, "Wetlands Regulations."

1. Socio-economic profile
2. Past, present, intended future use of wetlands property
3. Past, present, intended future modifications of wetlands areas
4. Knowledge of, feelings about, wetlands protection measures
5. Personal experiences with the wetlands regulatory apparatus
6. Concerns related to wetlands property ownership
7. Perceptions of wetlands value and the effect of regulations on that value.[1]

The first part of our study entailed a detailed survey of the records of state and local wetlands regulatory programs including Conservation Commission files of Notices of Intent and Order of Conditions. From these records, building inspector reports, and assessors maps we identified and interviewed one hundred and seventy-one wetlands property owners in the Towns of Marshfield and Falmouth; one hundred in-person interviews were completed in Falmouth. Our survey was not confined to people who had direct encounters with wetlands regulatory programs, although we attempted to interview every residential property owner who had filed a Notice of Intent with the local conservation commission. In this chapter I examine the results of the survey of

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[1]Ibid., p.2

wetlands property owners in Falmouth and compare these results with my recent survey of Falmouth developers, etc. (which I will refer to as my thesis survey).

Just as in my thesis survey, wetlands property owners perceived the Falmouth Conservation Commission as playing the central role in wetlands regulation. But their knowledge of the Wetlands Protection Act and the functions of the Conservation Commission was quite low. Our survey revealed that 63 percent of the 100 Falmouth interviewees had little or no knowledge of how this wetlands protection system operates. However, 38 percent of our sample had had direct or indirect experiences with the Conservation Commission; nevertheless many of these people were among those of little or no knowledge of the program.

Few interviewees had encounters with other wetlands regulatory programs. The National Flood Insurance Program was the only other system of wetlands regulation that elicited much response. Although a few people were aware of the local wetlands bylaw no one really commented on it. In contrast, one of my thesis interviewees was vehemently opposed to the bylaw. He pointed out how town meetings were more than willing to adopt wetlands bylaws without looking at the impact (see Chapter Four, Question Eleven). He expressed the belief that conservation commissions want bylaws to avoid the appeal to DEQE. But most of the builders and developers were confused how the bylaw differed from

the Wetlands Protection Act.

Falmouth wetlands property owners expressed a strong commitment to the general principle of environmental protection; 88 percent felt protective laws and regulations were necessary to preserve the wetlands environment. Developers and builders (see Chapter Four, Question Sixteen) agreed that these laws were necessary even though they were unhappy with the local Conservation Commission's administration of wetlands programs.

On the other hand even property owners said their commitment to wetlands protection had its limitations; 72% of the interviewees felt the filling of wetlands should be prohibited, but two thirds of those respondents said exceptions should be made when a public benefit is involved. Developers and builders were opposed to any outright ban. However, a few people said they could accept a ban if wetlands was a definitive term and not an area "that was dry eleven months of the year." A Falmouth realtor was even more lenient; he would allow filling to add "a small piece to round off a lot so that you can build" (see Chapter Four, Question Seventeen).

Falmouth property owners were also asked what effect wetlands on or near their property had on the market value of their property; 78 percent felt that wetlands enhanced their property value; 8 percent felt that wetlands had no effect on the value; and 6 percent felt that they detracted

from the value. Our research also found that:

> A minority, however, gave answers to questions on wetlands value suggesting they believed their neighbors' wetlands, which contributed to their privacy, sense of open space, and esthetics, were more valuable to them than their own wetlands, which they viewed as inhibiting their access to the water or as presenting the kind of property maintenance problems one usually associates with crabgrass.[1]

A smaller majority of property owners, 58 percent felt that regulations enhanced the value of their wetlands property; 19 percent thought regulations had no effect and 15 percent said regulations detracted from the value of their wetlands property.

Falmouth property owners expressed a preference for local control of wetlands regulatory programs, 45 percent. Only 10 percent chose the federal government and 22 percent preferred a state controlled program. My thesis interviewees agreed (see Chapter Four, Question Eighteen) that local knowledge and customs were superior. However, many developers pointed out the necessity for a state appeal process to protect against any local decision that they considered unfair.

In contrast to developers, 37 percent of the property owners chose the present system of private ownership as the best system of wetlands ownership, perhaps because they, as tax payers, would have to bear the burden of public

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[1]Ibid., p.9.

acquisition. "A surprising 30 percent chose conservation trusts as the best proprietors, however, possibly indicating an underlying general dissatisfaction with the present state of the wetlands environment they knew best."[1] Developers' responses were evenly spread among the conservation trusts, the town, and the state.

Special attention was paid in our Falmouth survey to open-ended responses which related personal experiences with wetlands regulation. Just as in my thesis survey, many complaints were made about an alleged lack of expertise or bias of conservation commission members, and inconsistent and uneven enforcement of wetlands regulations. Nevertheless 63 percent of wetlands property owners who had direct or indirect experiences with the conservation commission judged the system of be a fair one.

Developers and others in my thesis survey were generally unhappy with the local administration of wetlands protection. They expressed many of the same complaints as property owners but perceived the Conservation Commission as frequently unfair and unqualified to make decisions on many projects. For example, one interviewee complained that a hearing on the dredging of a small private boat basin was handled as if the applicant was dredging a container port.

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[1]Ibid.

In addition he said he believed the Conservation Commission asked poorly reseached questions concerning the protection of shellfish and wildlife.[1] Developers and others complained about the vagueness of the seven interests of the Wetlands Protection and argued for stricter guidelines and standards.

During both surveys I found direct and indirect experience with wetlands protection programs to be an important determinant in an interviewee's keenness of judgment of these programs. Developers and builders were generally more astute, whereas wetlands property owners frequently had little to say unless they had had encounters with wetlands regulatory agencies.

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[1]The protection of wildlife is not one of the seven interests of the Wetlands Protection Act, although it is protected under the Falmouth wetlands bylaw. However, this interviewee complained that the Conservation Commission frequently interfered in areas beyond its jurisdiction.

CHAPTER SIX

CONCLUSIONS AND POLICY RECOMMENDATIONS

This final chapter contains two sections. In the first section I discuss the four major conclusions of this thesis. In the second section I convey the policy recommendations that were expressed to me by builders and developers in my survey.

Section I

Conclusions

There are four major conclusions from this thesis:

1. there is wide support for the principle of wetlands protection among developers and builders;
2. the Wetlands Protection Act was viewed as having the most pervasive impact on development of any wetlands regulatory program in Massachusetts.
3. overall strategies for development seem to be changing in wetlands areas; and
4. there is discomfort and discontent among developers and builders with the present system of wetlands use regulation.

My survey revealed wide support for the principle of wetlands protection. Developers and builders expressed the belief that wetlands are an environmentally and ecologically important resource. All interviewees agreed that protective laws and regulations are necessary to preserve the wetlands environment.

Furthermore, developers and builders felt the Wetlands

Protection Act has had the most pervasive impact on development of any wetlands regulatory program in Massachusetts. In many cases they felt the Act has an even greater effect on the feasibility of a project than local zoning regulations. They perceived local zoning as a given. In contrast the Wetlands Protection Act was seen as prone to a subjective review because of unclear standards and differing interpretations.

This perception was supported by their different reactions to various conservation commissions. While south shore interviewees were generally satisfied with the Quincy Conservation Commission, Cape interviewees were generally dissatisfied with the Falmouth Conservation Commission. Although it was not apparent to me that this contrast was due to different levels of enforcement, additional research is needed to confirm this. Still despite the complaints about conservation commissions, most developers and builders preferred a locally managed system of wetlands use regulation with state overview than any other system of control.

Overall strategies for development seem to be changing in wetlands areas. The interviews revealed that developers and builders plan their projects to minimize problems with wetlands regulatory agencies; they are aware of the costs of a poor design. Furthermore, other evidence suggests that the edge of wetlands resource areas is moving further inland because of wetlands regulations. The extent to which this

is true is an indication that the system is working as planned.

Developers and builders also expressed discomfort and discontent with the present system because of what regulations cost them. They described four costs caused by the Wetlands Protection Act: 1) delay costs; 2) Order of Conditions modifications; 3) increased design and engineering costs; and 4) management costs. Some of these costs should be viewed as part of the risk of speculative investment. It is also uncertain how much these costs are absorbed by the developer and how much they are passed on to the consumer. Since housing in wetland areas is a subset of the entire housing market and must compete with less regulated housing, it is likely these costs are shared. Other studies have revealed that eventually and inevitably regulation will inflate the cost of housing.[1] However, coastal sites represent a scarce commodity in high demand. As a result, it is likely that the scarcity of these sites will force prices to rise sufficiently to at least cover all contractor costs.

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[1]Michael Elliot, "Public Regulation of Residential Development: Impacts on Housing Price," Massachusetts Institute of Technology, February 1980, p.9

Section II

Policy Recommendations

If I were to make policy recommendations on the basis of builders' and developers' comments in my survey, I would suggest the following:

1. DEQE should establish criteria for the appointment of all conservation commission members, so that all interest groups are represented.
2. DEQE should more strictly define wetlands resource areas.
3. All wetlands resource areas in Massachusetts should be mapped.
4. Delay in the approval process should be reduced.

Recommendation #1 was suggested by a representative of a builders' association who felt that the interests of builders and developers are often overlooked or ignored by overzealous environmentalists on many conservation commissions. In addition he felt that wider representation of interests would solve the perceived problem of lack of expertise on the commissions and improve the quality of the Order of Conditions.

Recommendations #2 and #3 were suggested by several interviewees who felt that the wetlands resource areas were too loosely defined; at present they felt that the regulations protected not only "legitimate" wetlands but many areas of insignificant ecological importance. Developers and builders

felt that stricter definitions and maps would aid wetlands program managers as well as themselves in systematically determining whether new construction fell within the jurisdiction of the Wetlands Protection Act.

Recommendation #4 was suggested by many interviewees who felt there was too much delay inherent in the present approval process. The first three recommendations were aimed at shortening delay and there are probably other modifications that could speed the process. It has been suggested that abuttor appeals (which represent 40% of all appeals) might be an area where delay could be reduced. Additional research might address the question of whether these appeals are being abused as well as investigate other means to shorten delay.

It seems evident from this research that wetlands regulations are here to stay. Developers and builders as well as private property owners are convinced of the need for wetlands protection. Public opinion has changed dramatically in the last twenty-five years; people are now aware that it is likely the mosquito breeding swamp across the street has important ecological and environmental functions. The difficult problem is the design of a regulatory system that is equitable and efficient and at the same time effective in protecting wetlands.

APPENDIX A

Quincy Socio-economic Data

Table 1

Population of Quincy

Year	Population	Percentage Change
1950	83,835	
1960	87,409	4.3%
1970	87,966	.6%
1975	91,487	4.0%
1990	96,200*	5.1%

*projected

Source: Eastern Massachusetts Metropolitan Area Waste Water Treatment Study, 1977

Table 2

Quincy Size and Density

Area	16.5 square miles
1975 density	5,550 persons/square mile

Source: Quincy Building Department

Table 3

Quincy Population by Age Group

Under 5	7,125
5-9	7,371
10-14	7,830
15-19	7,389
20-24	7,523
25-29	3,882
30-34	3,974
35-39	4,008
40-44	4,671
45-49	5,207
50-54	5,403
55-59	5,081
60-64	4,537
65-69	3,954
70-74	3,288
74-79	2,421
80-84	1,380
85+	922
Median	31.1
Under 18	26,873

Source: 1970 U.S. Census

Table 4

Quincy Age of Population

Age	1975	1976	1977
18-24	14.6%	13.1%	13.2%
25-49	27.3%	29.1%	29.7%
50+	32.5%	32.0%	32.0%

Source: Land Use Marketability Study for the CBD of the City of Quincy

Table 5

Quincy Population by Race and Sex

Total	White	Black	Other	Total Minority
87,966	87,941	129	346	475
Percent				
100.0	99.5	0.1	0.4	0.5

Total	Male	Female
87,966	41,042	46,924
Percent		
100.0	46.7	53.3

Source: 1970 U.S. Census

Table 6

Income of Families and Unrelated Individuals
1960-1970

	Quincy		SMSA	
	1960	1970	1960	1970
Under $3,000	9.4%	5.3%	11.0%	6.1%
3,000-5,999	30.5%	11.4%	30.7%	10.8%
6,000-9,999	41.1%	25.1%	37.0%	23.2%
10,000-14,999	14.5%	32.4%	14.2%	29.8%
15,000-24,999	3.7%	21.4%	5.1%	22.0%
25,000-over	0.8%	4.4%	0.2%	7.7%
Median	$6,785	$11,094	6$687	$11,449

Source: 1970 U.S. Census

Table 7

Percent of Families and Unrelated Individuals
at Moderate and Low Income

	Quincy	SMSA
	Moderate Income-Low Income	Moderate Income-Low Income
1960	14.5% - 918%	13.4% - 10.1%
1970	7.4% - 5.3%	6.6% - 4.6%

Source: 1970 U.S. Census

Table 8

Number of Business Establishments and Employment

(Quincy)

	1964	1970	1973	1976	% Change 1970-1976
No. of Business Establishments	1,543	1,447	1,433	1,396	-3.6%
Employment	25,796	32,414	28,985	28,258	14.7%

Source: Massachusetts Department of Employment Security (Research Division)

Table 9

Unemployment Trends in Quincy

1970	1975	1976	1977	1978
4.1%	11.0%	9.3%	7.1%	6.4%

Source: Massachusetts Department of Employment Security (Research Division)

TABLE 10

Occupational Distribution

Quincy 1978

	Percent of Total Employed
Wholesale and retail trade	30.5%
Manufacturing	26.7%
Construction	5.4%
Banking, realestate, insurance and administrative offices	11.6%
Agriculture	.1%
Services	13.6%
Other	12.1%
Total	100%

Source: South Shore Chamber of Commerce, Business Inventory Report

TABLE 11

Major Industrial Firms

Quincy 1978

Firm	Product	Employment	Year Established
General Dynamics	Shipbuilding	5,444	1963
Boston Gear	Gears	1,600	1837
State Street South	Banking	1,315	1970
Raytheon Co.	Equipment	775	1951
Kemper Insurance	Insurance	650	1972
New England Telephone	Telephone	600	1895
Pneumatic Scale Corp.	Scales	560	1895
South Shore Bank	Banking	581	1836
Proctor & Gamble	Cleaning Products	300	1940
Dickenson Advertising	Printing	100	1957

TABLE 12

Housing Units in Quincy

	SF	2F	3-4F	5+F	Res.Alternations	Housing Units Authorized by building permits TOTAL
1969	16	4	8	801	8	837
1970	27	-	27	820	29	903
1971	18	-	7	621	18	664
1972	22	6	12	184	13	237
1973	39	4	4	1745	12	1804
1974(FY)	10	2	-	75	28	115
1975(FY)	15	4	4	113	6	142
1976(FY)	26	2	8	219	4	259
1977(FY)	26	-	-	488	8	522
1978(FY)	25	-	8	317	1	351

APPENDIX B

Falmouth Socio-economic data

Table 1

Falmouth Summer and Winter Population, 1975 and 1995
(in thousands)

Summer 1975	Winter 1975	Summer 1995	Winter 1995
51.2	20.7	80	31

Source: 1975 State Census and estimates of Philip B. Herr and Assoc.

Table 2

Falmouth Population by Race and Sex

Total	White	Black	Other	Total Minority
15,942	15,308	394	240	634
Percent				
100.0	96.0	2.5	1.5	4.0

Total	Male	Female
15,942	7,688	8,254
Percent		
100.0	48.2	51.8

Source: 1970 U.S. Census

Table 3

Falmouth Population by Age Group

Under 5	1,273
5-9	1,609
10-14	1,758
15-19	1,332
20-24	944
25-29	920
30-34	889
35-39	869
40-44	1,002
45-49	961
50-54	866
55-59	789
60-64	685
65-69	736
70-74	553
75-79	385
80-84	217
85+	154
Median	30.8
Under 18	5,572

Source: 1970 U.S. Census

Table 4

Falmouth Mean and Median Incomes, 1969,
And Per Capita Incomes, 1969 and 1975

1969		1969	
All Families and Unrelated Individuals		All Families	
Mean	Median	Mean	Median
$9,594	$8,324	$11,072	$9,881

1969	
Unrelated Individuals	
Mean	Median
$5,047	$3,557

Per Capita Income

1969	1975 (est.)	% Change
3,292	4,672	41.9%

Source: Bureau of Census

Table 5

Falmouth Employment
1977

Industry	Firms	Payroll	EMPLOYMENT Low	High	Average Employment	Percent
Agriculture, Forestry & Fisheries	31	$ 725,806	31-Jan.	161-Jun.	107	1.7
Construction	116	5,163,506	342-Feb.	481-Jul.	507	8.2
Manufacturing	23	3,901,968	272-Feb.	327-Oct.	302	4.9
Transportation, Communications&Utilities	28	2,646,972	213-Feb.	284-Jun.	245	4.0
Wholesale & Retail Trade	252	15,222,583	1,899-Feb.	3,051-Aug.	2,389	38.6
Finance, Insurance & Real Estate	31	2,348,571	246-Jan.	271-Aug.	258	4.2
Services	196	22,318,274	1,240-Jan.	3,378-Jul.	2,375	38.4
TOTAL	677	52,327,680	4,293-Jan.	7,867-Jul.	6,184	100.0%

Source: Massachusetts Division of Employment Security

Compiled by Cape Cod Planning and Economic Development Commission

Table 6

Housing Units in Falmouth

Total Housing
1970 Census 9,587

Housing Units Authorized by Building Permits		Cummulative Percentage Increase from 1970
1970	372	3.9%
1971	422	8.3
1972	519	13.7
1973	765	21.7
1974	320	25.0
1975	285	28.0
1976	363	31.8
1977	519	37.2
1978	336	40.7
1979	345	44.3%

Total Housing Units 13,833

Source: Cape Cod Planning and Economic Development Commission

Table 7

Average Annual Housing Construction in Falmouth

1950-1959	1960-1969	1970-1979
298	311	425

Source: Cape Cod Planning and Economic Development Commission

Table 8

Falmouth Size and Density

Area	43.8 square miles
1975 Density	475 persons/square mile

Source: Falmouth Building Department

Table 9

1972 Falmouth Land Use Data

Forest Land	Agriculture or Open Land	Wetland	Mining & Waste Disposal	Urban	Outdoor Recreation	Grand Total
16,657	3,069	4,053	364	6,545	816	31,504

Forest Land includes 40 different types which describe the forest by species, height, and density.

Agricultural or Open Lands include 11 types defined by vegetation which it supports.

Wetlands include 11 types defining open freshwater, shallow freshwater wetland, deeper freshwater wetland, and salt-water wetland.

Mining or Waste Disposal areas include 5 types, mostly mining for sand and gravel, and dumping areas.

Urban Land encompasses types and is defined by a large number of people living and working in closely ordered structures in a confined land space including access roads and parking facilities.

Outdoor Recreation is typed for participation, spectator, environmental, or water based. Each type includes the recreational complex: access roads, parking related facilities. State parks, State forests or town forests are types as forest land.

Source: Cape Cod Planning and Economic Development Commission

Table 10

1972 Falmouth Urban Land Use Data

Industrial	Commercial	Residential	Trans-portation	Open & Public
74	300	5,658	282	231

Total Urban Land Data

6,545

Industrial includes 2 types, light and heavy industrial land.

Commercial includes 3 types, shopping centers, highway commercial, and downtown shopping areas.

Residential includes 5 types ranging from estates to high density.

Transportation includes 5 types, airports, water based, railyards, bus and truck terminals, and divided highways.

Open & Public includes 3 types, public or quasi-public lands such as colleges, churches, schools, and open undeveloped land in or adjacent to urban areas or cemeteries.

Source: Cape Cod Planning and Economic Development Commission

APPENDIX C

Order of Conditions

Table 1

Quincy Order of Conditions
1972-1979

	SF	MF	ALT.	SHORE	D&P	FILL	DREDGE	PW	CORP	OTHER	TOT.
1972	-	-	-	-	-	-	-	-	-	-	-
1973	-	1	-	1	-	3	1	-	-	3	9
1974	-	1	-	-	-	5	1	2	-	2	11
1975	2	-	-	2	2	7	-	4	-	-	17
1976	2	-	-	-	1	5	-	5	-	-	13
1977	2	-	-	1	-	4	-	4	1	-	12
1978	2	-	-	1	-	3	1	3	-	1	11
1979	2	4	-	3	1	1	-	2	-	2	15
TOTAL	10	6	-	8	4	28	3	20	1	8	88

Note: Although Quincy Conservation Commission Cases show 96 cases during this same period, records were missing for several cases and several others had no Order of Conditions.

Table 2

Falmouth Order of Conditions
1972-1979

	SF	MF	ALT.	SHORE	D&P	FILL	DREDGE	PW	CORP.	OTHER	TOT.
1972	1	-	-	-	-	-	-	1	-	-	2
1973	-	-	-	6	3	-	-	-	4	1	14
1974	3	-	-	4	1	-	-	1	1	1	11
1975	2	-	-	5	-	-	-	5	7	1	20
1976	-	-	-	6	2	2	-	1	-	2	13
1977	2	-	-	2	5	1	-	1	10	-	21
1978	14	-	-	5	6	2	1	2	1	1	32
1979	36	-	2	-	6	-	-	-	2	5	51
TOTAL	58	-	2	28	23	5	1	11	25	11	164

Note: Although Falmouth Conservation Commission records show 175 cases during this same period, records were missing for several cases and several others had no order of Conditions.

APPENDIX D

Thesis Questionnaire

1. To what extent have you encountered wetlands regulations?

2. On the balance when a builder or developer studies the feasibility of a project which is more important local zoning or the Wetlands Protection Act?

3. What did you do differently because of the Wetlands Protection Act that you would not have done otherwise?

4. What would you have done in the absence of the Wetlands Protection Act regulations?

5. What didn't you do because of the Wetlands Protection Act?

6. Did you experience extra or special costs because of the Wetlands Protection Act that you would not have experienced otherwise?

7. If you were experiencing delay on a project, what were you doing in the meantime?

8. How even do you think enforcement of the Wetlands Protection Act has been from place to place and time to time?

9. Have you ever seen the Wetlands Protection Act used for other purposes than wetlands protection?

10. Do you think the system of wetlands protection administered by the conservation commission is a fair system?

11. What other wetlands protection programs have you encountered?

12. Do you know of projects moved to inland sites or cancelled because of real or feared problems with wetlands regulations?

13. Have you shifted your activity away from wetlands areas to avoid dealing with wetlands regulations?

14. Do you think protective regulations on wetlands use influence the value of wetlands property?

15. Do you think patterns of development near wetlands have changed because of local, state, or federal regulations?

16. I would like you to tell me how strongly you agree or disagree with this statement on a scale from 1 - 5: Protective laws and regulations, federal, state, or local are necessary to preserve the wetlands environment. (1 is strongly agree, 5 is strongly disagree)

17. Should the filling of wetlands be prohibited? If no, under what circumstances should filling be permitted?

18. At which level or combination of levels of government do you think the best program of wetlands regulations can be run, local, state, or federal?

19. Currently in Massachusetts the same rules and regulations apply to individual property owners building homes or modifying existing properties as to developers building new homes for the speculation market. Do you think this is how it should be?

20. In an ideal world who do you think would make the best owner of wetlands? A. Private property owner; B. Conservation trusts; C. Town; D. State; E. Federal government

21. What changes would you make in the present system of wetlands use regulation?

APPENDIX E

Interviewee Breakdown by Profession

	Cape Cod	South Shore
Developer	5	3
Builder	2	2
Realtor	3	2
Engineer	2	1
Bank Mortgage Officer*	2	1
Environmentalist	1	1
Conservation Commission Member	1	1
Total	16	11

*These three interviews were conducted by telephone.

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