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An Analysis of the Massachusetts Inshore Lobster Fishery

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AN ANALYSIS OF THE MASSACHUSETTS INSHORE LOBSTER FISHERY

LIMITED ENTRY PROGRAM

BY

PETER ROBERTSON HOAR

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE

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ABSTRACT

The purpose of this thesis was to explore the limited entry alternative of fishery management by examining the history of a particular limited entry scheme: the Massachusetts inshore commercial lobster fishery license limitation law. A review was made of existing limited entry theory, followed by a description of limited entry programs extant in U.S. fisheries. The legislative and political histories of the Massachusetts lobster fishery limited entry program was then examined. The limited entry law was then analyzed by comparing what actually occurred with what is supposed to occur according to limited entry theory. A quantitative analysis of changes in catch per unit of effort resulting from the law was demonstrated. Major events resulting from the limited entry law were then examined.

The overall conclusion of this thesis was that the limited entry program for this fishery has failed to achieve its objectives, but is not a failed policy. In effect, Massachusetts went half way to achieving the system they knew they needed for limited entry to be successful. This thesis concludes with a proposal on how the State should use limited entry in a new comprehensive lobster fishery management plan.
ACKNOWLEDGMENT

There are a number of people without whose help this thesis would have been a much more arduous task. First and foremost, I would like to thank my wife, Pookie, for providing the impetus and support I needed to continue work on this project in the midst of familial and professional distractions. I would also like to thank Dennis Nixon for his advice and support throughout. Many thanks are extended as well to Philip Coates, David Pierce, Jim Fair, Bruce Estrella, Charles Anderson and David Hoover of the Massachusetts Division of Marine Fisheries, each of whom wholeheartedly provided documents, data, advice and support for this project. Further, I would like to thank those who most graciously donated time for me to interview them. These people are Philip Coates, Senator William MacLain, Representative Robert Gillette, Elizabeth Stromeyer, Frank Grice, Allen Peterson, Robert Barlow and Roy Tate. Finally, I would like to thank my thesis committee for their time and invaluable advice.
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INTRODUCTION

While marine fisheries management in Massachusetts has existed for most of the State's history, only in the last two and a half decades has it become a dominant force in the way the fishing industry operates. Prior to that time, management actions were taken by the State Legislature and were based primarily on intuition and convenience, or to benefit fishermen and dealers by protecting them from competition.\(^1\) By 1960, however, steady increases in numbers of fishermen and amount of gear that had been occurring since World War II in all fisheries, including the inshore lobster fishery, forced a major change in Massachusetts fisheries management. During that year, the state's Marine Fisheries Advisory Commission (MFAC) was formed as a citizens body directly involved in the formation of fisheries management policy, and subsequently, the Division of Marine Fisheries (DMF) was expanded. This event marked the advent of formal, scientific marine fisheries management in Massachusetts.

Increases in effort in the Massachusetts inshore commercial lobster fishery occurred partly because increasing demand and prices stimulated expansion. This increased effort raised total landings from approximately 2 million pounds in 1940 to an average of 3.5 million pounds between 1950-1974.\(^2\) The other reason for this expansion

\(^1\) 

\(^2\)
was that the inshore lobster fishery was somewhere between common property and open access in nature.

The only difference between open access and common property is that, with the former, fishermen may enter or exit a fishery whenever they desire to do so, while with the latter, there are social or legislative restrictions on who can or cannot fish. For example, the Massachusetts offshore groundfish fisheries have traditionally been open access. On the other hand, legislative restrictions on entry into the inshore shellfishery, and social restrictions on entry into the inshore lobster fishery have historically made these fisheries common property. The inshore lobster fishery became more open access as motorized boats and hydraulic pot haulers came into use because the range and speed of operations increased. This tended to reduce territoriality. ³

In any case, both systems operate the same in terms of resource exploitation. That is, fishermen will tend to increase their individual effort in the manner described by Gerrett Hardin in his paper Tragedy of the Commons. Hardin describes the tragedy of the commons as the innate tendency of an individual to increase his stake in the commons regardless of the potential long term effects of that action. ⁴ Hardin’s example is of a herdsman who sees that the short term benefit, to himself, of adding one cow far outweighs the short term detriment to the commons, a pasture in this case, that the cow imposes. All the other
herdsmen using the commons also come to the same conclusion. Initially, and for some time, this arrangement works well since there are few cows and much pasture. But eventually, as each herdsmen within the commons adds more cows, the pasture becomes saturated, the grass runs out, and the herdsmen are ruined. Thus, the tragedy of the commons.

Hardin goes on to say that the tragedy of the commons is of a class of problems that does not yield to technical solutions; new fertilizers and special grass seed are not a cure. Rather, the only cure for this tragedy is through, as Hardin puts it, "mutual coercion, mutually agreed upon." Which is to say that people must be coerced into stopping individual expansion of effort by public agencies.

This tragedy manifested itself in the inshore commercial lobster fishery through increasing numbers of fishermen fishing greater numbers of traps while catch per unit of effort decreased. Although the average catch during the period from 1950-1974 averaged 3.5 million pounds, effort, in terms of numbers of pots fished, more than doubled while catch per pot decreased proportionately. The only thing that maintained the fishery during this period was continuous increases in ex-vessel prices. In short, the inshore commercial lobster fishery became overcapitalized while the coastal lobster resource became fully exploited.

Massachusetts responded to this situation, and to
effort increases in all of its fisheries, in two ways. First, in 1969, the Marine Fisheries Advisory Commission was given authority to override and preempt special acts of the Governor. This was followed in 1970 by general licensing for commercial fishermen which gave the Commission greater flexibility since it could tie licensing sanctions to regulatory and statutory violations. With this increased power and flexibility, the state was able to respond to effort expansion in all of its fisheries by implementing stringent regulatory measures over the actions of fishermen.7

One of these measures was implementation of escape vent regulations for the inshore commercial lobster fishery in the early 1970’s, which was designed to complement existing short and egg bearing lobster regulations. In addition, DMF, MFAC and industry all worked to discover ways of reducing effort in this fishery.

These efforts culminated in passage of a law in 1975 that placed a moratorium on entry into the inshore commercial lobster fishery while a study took place to design a more permanent limited entry program, and to discover ways of reducing effort. So began Massachusetts first attempt to implement limited entry in one of its major fisheries; a process that, so far, has taken 12 years and two laws to reach its present stage.

The purpose of this thesis is to analyze limited entry in the Massachusetts inshore commercial lobster fishery,
and from this analysis, to conclude whether this limited entry program has been successful. To do this a treatise of limited entry theory is presented, followed by a description of limited entry schemes extant in the U.S. The legislative and political histories of the program are then described, and the entire program is analyzed in relation to limited entry theory. The thesis concludes with a discussion of the successes and mistakes of this limited entry system. This discussion includes suggestions on what Massachusetts should now do to improve inshore lobster fishery management.
Notes


2 Ibid. p. 16.


5 Ibid. p. 1247.

6 Fair, 1978, p. 17.

CHAPTER I

THE THEORY OF TRADITIONAL FISHERIES MANAGEMENT AND LIMITED ENTRY

The Scope of Fisheries Management

Marine fisheries management in the United States covers a wide scope which consists of a number of significant factors. The fish stocks themselves are a factor since the dynamics of their life cycles greatly influences attempts to catch, study and manage them. In addition, fishermen are interested in maximizing their economic returns, and have cultural ties to the fisheries. State fishery management organizations are interested in optimizing the yield of the fisheries, but are also involved with the socioeconomic needs of their constituency (the fishermen and the public), and must handle intra-agency and inter-agency problems, administrative concerns and political pressure. Federal organizations must account for all of the problems of state agencies, only on a larger scale, and must conform to the tenets of the Magnuson Fisheries Conservation and Management Act. Society is also a factor since the fisheries, as well as other natural resources, are held by the government in the public trust, and it is taxes that pay for all management efforts.

The fundamental relationship between the U.S.
government, natural resources and the users of these resources was described by Theodore Roosevelt:

> The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value.\footnote{1}

Congress viewed the role of management agencies as managers and conservators when it placed the resources of the public lands and oceans in the public trust.\footnote{2} This meant that from the start, administrators of natural resources in the U.S. had to simultaneously reconcile the needs of the public and of the resources themselves. The complexity of fishery management, therefore, is obvious.

**Open Access and Common Property Resources**

**Definition and background**

Most fisheries in the U.S. are open access or common property in nature. Open access fisheries are those that have no restrictions on who can harvest or how much resource they can take. Therefore, open access resources are literally no one's property.\footnote{3}

Common property is defined as the distribution of property rights in which a group of identifiable users are co-equal in their usage rights. Access is free and open, use rights are not lost through non-use, co-owners are not necessarily equal with respect to quantities of the resources used over time, and there are no controls over the amount of capital and labor making use of the resource. Unlike open access, common property is not necessarily
everyone’s property. For example, foreign fishing boats do not have the same rights of access to fisheries in the Exclusive Economic Zone (EEZ) as do U.S. boats. In addition, social and physical restrictions on resource use, such as those defined by traditional use patterns and government regulations, restrict access.

The fisheries of the United States are open access or common property resources primarily because these fisheries historically have been abundant. When resources are abundant, there is little need for collective management, and the evolution of property rights is retarded. Hence, the resources are left open to be accessed by anyone. T.X. Huxley reflected the historical view of marine fisheries resources when he said:

I believe that probably all the great sea fisheries are inexhaustible; that is to say, nothing we do seriously affects the number of fish.

This explains why property rights and collective management of marine fisheries resources did not evolve along with land resources. In the U.S., property rights and collective management of terrestrial natural resources such as land, water and minerals were necessary as much as a hundred years before they became necessary for marine fisheries. It has only been since World War II, when the fishing fleet expanded dramatically in response to increases in demand, that fisheries overexploitation was recognized as a serious and widespread problem.

Another reason why marine fisheries property rights and
Collective management evolved slowly is because of the inherent difficulty of owning or managing resources that move and cannot be seen. These two characteristics of marine fisheries resources, alone, make ownership, management and enforcement extremely expensive propositions. It is because of this that U.S. marine fisheries have tended to remain open access and common property even with severe resource depletion.

Consequences of common property

There are several shared consequences of open access and common property in the fisheries. Fundamentally, both circumstances produce excessive use of the resource and overcapitalization by fishermen. Excessive use is intensified because every good year for fishing produces increased construction and entry while decline in incomes during poor years does not produce an equivalent reduction in capacity. These events force the implementation of additional regulations, thus causing increased costs to the fisherman and increased management costs. Furthermore, enforcement is a problem since fishermen are motivated to disobey the rules if they believe others are disobeying them also, or if they believe the rules are unfair. With open access and common property, excessive capital and labor will enter the fisheries, overcapacity will worsen as market prices rise (presuming they don’t rise enough to lessen consumer demand), biological depletion will occur and costs of management will fall on the taxpayer.
Indirect conservation measures

Biological Management of open access and common property fisheries has usually included a variety of so-called indirect methods whose purpose is to reduce fishing effort. The term indirect comes from the belief that the best way to achieve resource conservation is indirectly through management methods applied to the fishermen. In effect, these management methods reduce the efficiency of fishing operations. Indirect methods are widely used in fisheries management because it has long been believed that if effort on a fishery is reduced, overexploited fish stocks will revive.  

However, even though it seems intuitively obvious that reducing fishing effort will allow fish stocks to revive, using indirect methods, alone, to achieve conservation objectives under open access or common property is inadequate. The reason for this is that, in order for biological management to be effective (that is, for depleted fish stocks to revive), all aspects of effort must be reduced. Since indirect methods only address the harvesting aspect of effort, fishermen respond by increasing their effort in other ways. This results in the consequences described above.

So what is the direct effect of indirect biological management methods? A system utilizing indirect methods increases the costs of fishing operations, and dictates who can fish where, when and on what. Therefore, resource
allocation is the direct effect of using indirect methods. The scenario for attempting to conserve fish stocks in open access or common property fisheries using indirect methods is described as follows:

Let's assume that scientific study has shown that too many spotted trout were being caught. In order to bring the level of removals back in line..., it was determined that fishing mortality needed to be reduced. End of Biology and the beginning of socio-economic decision making.

Not only has the use of indirect methods effected the allocation of fisheries resources, it has also effected theory. Biological management models advocate maximum sustainable yield (MSY) in maintaining the health and self-sustaining capacity of fish. In these models, harvests in excess of MSY are biologically indefensible. On the other hand, economists advocate a maximum economic yield model (MEY) where production is maximized for the lowest cost per unit of effort. This model demands that fish be caught as soon as they reach maturity, or at least before their growth rate decreases. In practice, since indirect methods tend to allocate resources, management actions tend to be built around economic issues. This has resulted in the optimum yield (OY) model, which evolved as a compromise between ecological, social and economic considerations in resource management.

Indirect methods of fisheries management include area/season closures, gear regulations, size limits, and quotas. The purpose of area closures is two-fold: to protect fish that are spawning or for other reasons need to
be protected, or to allocate areas to specific gear types to mitigate gear conflicts. Season closures function in the same way as area closures except they are restricted to certain times of the year.

For example, a spawning closure is an area/season closure since presumably it closes fishing areas in which fish spawn during their spawning period. Gear restrictions include trap and trawl limits for fixed gear fishermen, cod-end mesh size, door size and warp restrictions for draggermen and vessel size restrictions in any fishery. Size limits are designed to protect juvenile animals so that there is strong recruitment, or so that animals are allowed to spawn at least once before they are harvested. Size limits therefore seek to maintain high year class strength prior to recruitment. Quotas theoretically protect resources by directly affecting the amount of fish that can be caught either by trip, season or species.

**Alternatives to the Traditional System**

**Goals and objectives**

Before deciding which system will work best for a given fishery, managers must determine what objectives are desired. To this end, it is first necessary to establish what rights exist in imposing regulations. Three major property rights in fisheries management are the right to conserve, the right to control access and the right to extract rents. The right to conserve has for many years
been accepted as a primary right for agencies that manage resources in the public trust. The right to extract rents is also accepted by the legal and legislative establishment. The right to control access is still being debated so far as entrance into fisheries is concerned, but has in fact been exercised for years by fishery management agencies using traditional methods of management. Harvest quotas, season closures, area closures, gear requirements, size limits and trip limits all restrict access to fish stocks.\(^\text{19}\)

With these rights firmly established, managers are able to set goals and objectives. State and federal managers generally accept the Magnuson act goals and objectives of fisheries management which are:

- to prevent overfishing or depletion of fisheries resources while achieving, on a continuing basis, the optimum yield from each fishery which enhances the industrial health and stability of fisheries and generates the greatest possible social and economic values to the people of the United States.\(^\text{20}\)

Attempts to achieve these goals and objectives are usually undertaken using ecological, technological, economic, social, political and administrative measures.\(^\text{21}\) That is, through indirect management techniques.

However, since it is the fishermen who bear the brunt of whatever system managers choose to achieve their goals and objectives, the planning of management systems must include realistic assessments of how fishermen will react to regulations. For example, the cheapest, most politically feasible and most efficient management measures
to maintain and increase fish stocks are ones that utilize the profit seeking motives of fishermen.\textsuperscript{22} Also, fishermen's economic incentives rarely favor conservation under open access or common property because the prevailing opinion among them is that whatever resource a fisherman saves for tomorrow will be taken by another fisherman today.\textsuperscript{23} This last consideration must, however, be tempered by the realization that fishermen are not always economically rational.

Being economically rational implies that fishermen will seek to maximize profits and minimize costs regardless of what effects such actions have on fellow fishermen or on the resource. That is, an individual takes as fast as he can, purely for the profit. However, in reality, fishermen do cooperate with one another in using the resource, and with managers in conserving the resource. Community and life-style are important factors in people's desire to be fishermen, and maintaining that life-style requires a certain amount of cooperation. Examples of this include communal recognition of territories, voluntary effort limits, communal fishing strategies, cooperative marketing and fishermen's associations.\textsuperscript{24} Many fishermen are also directly involved in the management process through advisory commissions and lobbying.

One consequence of overfishing and overcapitalization, however, is increased economic rationality. The more individual fisherman feel the pinch, the more likely they
will develop a me-first attitude.

Types of management systems

Once the objectives of fisheries management are determined, agencies may decide between the different types of management systems. There are several alternatives to the traditional management system. These include laissez faire, economic incentives or disincentives, augmentation of the resource, limited entry, a continuation of the present system, or a combination of these methods.

Laissez Faire

The laissez faire method of fisheries management is mentioned more because it exists within the realm of possibility than because of its feasibility, since it is unlikely that management agencies will relinquish control over fisheries resources. However, for discussions sake, Laissez Faire does raise some interesting questions. If formal fisheries management were phased out, would some form of equilibrium be achieved between fishermen and fish as in a classic predator prey relationship, or would fish stocks become extinct? Also, is it conceivable that management control over the fisheries would be taken over by private entities? For example, might fishermen’s groups manage fisheries resources either through cooperation or through coercion?

It can be argued that a form of laissez faire management occurs under open access or common property. Some regulations are so difficult to enforce, some places
so difficult to get to and most law enforcement agencies so poorly funded that some fishermen operate as if regulations were not in effect. There is ample evidence of this. For example, sale for cash, falsification of catch reports, equipment modifications (such as cod-end net liners), and cheating on area closures are all effective means of avoiding regulations. In any case, the present trend in fishery management is toward more efficient methods of management rather than towards no management at all.

Economic incentives and disincentives

Another form of fisheries management is a system of economic incentives or disincentives. Under this system, incentives are put in place to prompt fishermen into targeting underutilized species by using tax breaks or other similar methods, or to get out of fishing altogether through vessel buy-back programs. Disincentives are simultaneously put in place to force fishermen to avoid traditional high-valued species. However, substantial management costs exist for monitoring and predicting catch rates and administering the program. Furthermore, targeting underutilized species in open access or common property fisheries will not cure the tendency for fish stocks to become depleted.

Another form of economic disincentive is to levy taxes or royalties on fish landings, the logic of which is to change economic incentives in the right direction. In theory, fishermen operating under open access or common
property lack the economic incentive to conserve that exists with other natural resources such as privately owned range land. If a rancher over-grazes his land, he suffers a direct loss in economic assets. On the other hand, the cost of reducing fisheries resources is not directly felt by individual fishermen since they do not own a finite portion of the resource. Taxes and royalties on landings therefore attempt to artificially instill financial interest in the economic value of fish stocks by attaching such a cost to fishing. This type of system has never been tried in the United States primarily because its political feasibility is questionable.  

Resource augmentation

Resource augmentation through seeding or aquaculture is another possible management option. This method allows for the replenishment of resources either through the use of hatcheries, or through the use of enclosed ecosystems in which fish species are raised until maturity. One problem with seeding is that it is impossible to determine the success of the process. For example, lobster larvae ready for release cannot be tagged because they shed so often. As a result, it is presently impossible to determine what percentage of released lobster reach maturity and therefore benefit the resource. Nevertheless, this method does serve political and research purposes for management agencies. For example, a method for tracking released animals may yet be found, and fishermen wholeheartedly support seeding
efforts.

For the most part, aquaculture is not yet a viable option at this latitude because of the climate, the migratory nature of most valuable fish species and the lack of available land for fish farms. According to Hardin's theory, the tendency for fish populations to continue being depleted will remain with resource augmentation since this is a technological solution to the tragedy of the commons.

Maintaining the present system

Another option for managing fisheries is to maintain the present system of indirect controls. This should be kept as an option for two reasons. First, analysis of different types of management systems may reveal that while the resource remains open access or common property, a system of indirect controls is really the best option. In this case, the likely reason is that significantly changing the system is politically infeasible. Second, even with other management strategies it may be desirable to maintain indirect controls as is considered the case with limited entry systems.

Use of a combination of techniques

The present management system really does consist of a variety of methods, in fact some aspect of virtually every method mentioned above. For example, laissez faire exists when fishermen disregard regulations. Some form or another of resource augmentation is used by many U.S. coastal states. Economic incentives or disincentives, such as
vessel buyback programs, vessel subsidies and consumer education programs for underutilized species are also widely used. This overlap of methodology occurs because of the different needs of particular fisheries, regional socio-economic differences, management goals changing over time and historical changes in management authority.

Overall, however, a carefully thought out management plan, which takes into consideration the socio-economic differences between fisheries, as well as within single fisheries, will most likely be made up of numerous management strategies, each of which is designed to address one aspect or another of total effort on the resource. As mentioned earlier in this section, carefully thought out management plans thus attempt to reduce all aspects of effort. Therefore, if the goal is to approach OY, plans must address how many fishermen will be allowed to participate, as well as how efficiently they harvest product. Entry limitation is therefore an integral part of the ideal fisheries management plan.

**Limited Entry**

**Definition**

Limited entry directly reduces inputs into a fishery by restricting fishing to the holder of a legal right of access. By regulating the fishing privileges of specific fishermen or vessels, entry limitation improves the economic efficiency of those fishermen or vessels that
remain in the fishery.28

The essential difference between limited entry and traditional management methods is that it regulates who can harvest, and potentially how much can be harvested, while traditional systems attempt to control harvest levels without saying who is allowed to harvest.29 That is, traditional management methods attempt to achieve biological conservation while allowing effort to increase in terms of the total number of fishermen. On the other hand, limited entry taken alone regulates effort in terms of the total number of fishermen but does not control individual fishermen’s effort.

Therefore, limited entry addresses an aspect of fishing effort that is overlooked by traditional methods by placing limits on inputs into a fishery. As a result, both traditional conservation measures and limited entry, together, conserve fish stocks by controlling overall fishing effort.30

The concept of limited entry is not new to resource managers, having been employed in forestry, grazing, minerals, recreational hunting and fishing and in commercial fishing throughout the world.31 For example, limited entry was an integral part of the ancient fishery management systems of many South Pacific islands where, due to the lagoon/reef ecosystems, the fisheries were rarely, if ever, plentiful.32 In the U.S., limited entry has been used for fisheries management since colonial times.
However, until recently, these systems tended to be localized and of short duration.\textsuperscript{33}

Among different fisheries management methods, limited entry has received the most attention and the greatest controversy since it seeks to restrict freedom of entry into a profession that is noted for its independence. This controversy persists even though limited entry has been employed by a number of fisheries management agencies in the United States.\textsuperscript{34} Limited entry is also controversial because it opens an array of public policy issues concerning the preservation versus exploitation of fisheries resources, and the role of government in this process.\textsuperscript{35}

**Types of limited entry**

There are two classes of limited entry, indirect and direct.\textsuperscript{36} Indirect systems include taxes and fees, fisherman quotas, price adjustments and other measures that significantly increase the costs of fishing. Indirect measures used in biological fisheries management can fall into this class if they are stringent enough to make fishing prohibitively expensive. In tax based systems there are no regulations prohibiting entry into a fishery, but participants may be taxed on poundage landed. Marginal harvesters are discouraged by added costs, and some economic rent is extracted for society's benefit.\textsuperscript{37} Quota systems may limit entry because regulating the number of pounds of fish caught makes it unprofitable for many
operations. Price adjustment schemes require that ex-vessel transactions take place at adjusted prices, and operates in the same way as landing taxes.\textsuperscript{38} Indirect limited entry exists, therefore, when a fishery is too expensive for many to get into or to stay in.

Direct systems include license limitations on either boats or fishermen, stock certificate programs, territorial use rights in fisheries (TURFs) and commodity shares.

License systems are the most common form of limited entry in the U.S. because they are the simplest to implement and administer. These schemes control the number of participants in the fishery by limiting the number of licenses to fishermen or vessels. Criteria are established for how licenses are to be allocated among historical and potential participants.\textsuperscript{39}

License limitation converts open access fisheries into a kind of common property where a fishery becomes made up of an identifiable group of users with co-equal use rights. Because the fishery is common property, competitive free enterprise motivates each fisherman to attempt to increase his share of the resource. As a result, adequate resource conservation does not occur with license limitation alone since the tragedy of the commons comes into play. Further conservation measures are therefore always needed with this system.\textsuperscript{40}

Stock certificate programs divide portions of the stock into shares which are then allocated among fishermen in
open market rather than being assigned to fishermen based on arbitrary criteria. One theoretical advantage of this type of system is that it overcomes the equity problems encountered with other forms of limited entry. Shares are placed on the open market and everyone who can afford to buy them has equal opportunity to do so just as if they were buying stock in a company. This system also places a cost on fisheries resources. In all other business involved in natural resource exploitation, costs exist for the basic resource. A commodity shares system would therefore place the fishing industry more in line with the capitalist free enterprise system.43

Territorial use rights in marine fisheries (TURFs) attempts to overcome two perennial problems in fisheries management: inefficient production of net benefits and equity. Territorial use rights have existed for centuries, being seen most often in sedentary species fisheries. However, TURFs have also existed in other fisheries as well, mostly through the traditional establishment of territories. This form of management divides the ocean resource into shares, rather than the fish stocks themselves.44

Justification for limited entry

Economic justification for limited entry systems is often based on the perceived failure of the traditional management approach in the open access environment resulting from the tragedy of the commons.45 Some
economists feel that limited entry by ecosystem is an integral part of any management scheme if other measures are applied as well. Any management scheme without limited entry therefore has undesirable effects in terms of freedom of participants, administration, enforcement and the fish themselves. In other words, any management system that does not control inputs to fishing cannot offer much lasting improvement in economic performance over open access.

The economic theory behind limited entry is that it eliminates the tendency for economic rent to be dissipated as happens with common property. That is, fishermen no longer have to worry about their profits gradually dwindling to nothing as additional competitors enter the fishery.

Furthermore, limited entry provides three major conservation benefits. First, it places a relatively permanent limit on the input aspect of fishing effort (either the number of fishermen or the number of boats). For example, capping or reducing the number of people or vessels entering a fishery will temporarily reduce effort on the resource.

The reason effort reductions from limited entry are only temporary is because it makes fisheries resources common property. Therefore, fishermen still tend to take advantage of the decreased competition engendered by limited entry by increasing their individual effort. In
the lobster fishery, fishermen increase their effort by increasing the total number of traps and by lengthening their trawls. In the long run, these individual increases in effort dissipate the conservation benefit of reduced numbers of fishermen.

The second conservation benefit of limited entry is that entry into a fishery is controlled when successful conservation efforts have caused fish stocks to revive, or stock improvement has occurred as a result of natural causes. This benefit might be seen when adequate controls on individual fishermen's effort are implemented concurrent with the limited entry program.

The third benefit of limited entry is that it creates a potential pool of political supporters for conservation management among those who are left in the fishery.50 This would occur when fishermen become convinced that present sacrifices to conserve the resource would not be unfairly distributed among present competitors, or among new entrants.

The administrative justification for limited entry is that reducing the number of units in need of regulation, whether they be boats or fishermen, reduces the costs of management. Reduction in the number of units also increases the efficiency of management, which results in society realizing the benefits of a properly managed resource.51

Most existing limited entry systems in the U.S. are
justified on the basis of two potential outcomes. First, that greater economic efficiency will be achieved and second, that management will be made simpler because of the presence of fewer fishermen. \(^{52}\)

The objectives of limited entry

The development of management plans, including those utilizing limited entry, should include a set of goals. This provides management agencies with definite circumstances to strive for once the plan is implemented, and gives management criteria against which the plans' elements can be compared to judge their effectiveness. Generally, the objectives of limited entry management are socio/economic since it protects fishermen from the effects of their own actions or from the actions of others. \(^{53}\) In this context, the numerous specific possible objectives of limited entry systems can be divided into three areas: economic, social and biological.

Economic objectives may include promotion of economic efficiency, enhancement of fishery product value, increase and stabilization of fishing fleet profitability and reduction in fishery management costs born by the public. \(^{54}\) Economic efficiency can be promoted because economic rent is no longer dissipated among new entrants. Fishery product value may be enhanced, especially in quota or shares type limited entry systems, because fishermen are no longer forced to harvest in a hurry, and therefore can afford to supply a quality product. Profitability of the
fishing fleet may be improved since reduced entry and exit tends to stabilize profit. Fishery management costs born by the public may be reduced because there are fewer units to manage, and limited entry may render some existing regulations unnecessary, thus allowing their repeal.

Sociological objectives may include establishment of secure tenure in the fishery, reduction in the burden of management regulations on fishermen, establishment of an equitable distributions of benefits from the fishery, and protection of the fishery from other commercial or non-commercial interests. Tenure may be secured through increases in fishermen's profits combined with reduced entry, deletion of state imposed performance requirements, and long term benefit from sacrifices made to conserve stocks. Reduction in management regulations obviously improves the conditions under which fishermen operate. Equity may be addressed through adequate grandfathering, that minimizes dislocation when limited entry is implemented. Specific entry requirements and careful design may protect the fishery from attacks by non-commercial interests such as recreational fishermen, or by large company attempts to control the fishery.

Limited entry may help to conserve stocks either directly, through shares or quota systems, or indirectly by reducing the input aspect of effort in all forms of limited entry. It must be stressed, however, that this goal cannot be achieved in license-type limited entry without controls.
on individual fisherman effort.

Limited entry feasibility

In addition to these goals, the political and administrative feasibility should be considered carefully in the design of limited entry schemes. As one fisherman puts it, limited entry should reduce fishing mortality while maintaining economic viability and simplifying management and enforcement. 56

Overall, three areas of administrative feasibility must be explored. First, there must be the likelihood of adequate enforcement. This can be addressed either by strengthening enforcement agencies or by minimizing the need for additional enforcement by designing regulations that the fishermen are more likely to obey. Second, organizational adjustments that will be necessary with the new program must be anticipated. For example, with licensing systems, adjustments have to be made to accommodate license renewal, license transfer and decisions relating to hardship applications in order to mitigate administrative difficulties that can occur with these types of systems. Third, the matter of costs and who will bear them needs to be addressed. Under traditional forms of fisheries management, costs are born by the fishermen and by the taxpayer. Limited entry programs should be designed to ensure that the costs to both of these groups are reduced. 57
Elements of a limited entry program

Regardless of the type of limited entry scheme proposed, there are certain basic elements of the plan that should be carefully considered. By basic it is meant that whether or not plan designers consider each one of these elements, it is likely they will be considered somewhere along the line, by legislative or regulatory reaction to political pressure, and sometimes to the detriment of the plan’s original goals. This unsavory event has occurred with both versions of the Massachusetts inshore lobster fishery limited entry plan.58

These elements of a limited entry plan can be considered decision categories since each one requires making policy decisions.59 Some of the major elements are as follows: The scope of the fishing activity to be restricted, the type of limited entry to use, the initial allocation of harvest rights, the transferability of harvest rights, the longevity of harvest rights, mechanisms required for adjusting the number of harvest rights, and how to handle disputes regarding issuance and transfer of rights.60

Also the degree of hardness or softness of a limited entry plan’s provisions must be calculated. The harder the program is in terms of how stringent the measures are and how rigorously they are enforced, the more likely it will create administrative and political difficulties, especially regarding equity. The softer the program in
terms of accommodating everyone's needs, the less likely it will achieve economic, sociological or biological gains.  

Consequences of limited entry

There are many consequences of limited entry systems, all of which may be divided into five categories: economic, sociological, biological, political and administrative. Major economic consequences may be expected with the implementation of a limited entry system, since the primary effect of limited entry is improvement of the economic well being of those who are left in the fishery. However, with the creation of economic benefit for some, there is the imposition of economic hardship on others. Issues raised by the economic consequences include appropriation and dissipation of wealth, inequality, overcapitalization and technological externalities, low labor productivity, no incentives for crucial technological development and increasing administrative cost. All of these issues have proved important in existing U.S. limited entry programs, and mechanisms for dealing with them should be incorporated into the design of any program.

The sociological consequences of limited entry may also be profound. Fishermen fish for many reasons aside from economic gain. These reasons include way of life, historical family involvement and geography. This theory supports the idea that fewer people in a fishery, who are secure from the consequences of common property, will feel obliged to husband the resource. Voluntary effort
limitations, the fisheries history of the South Pacific islands of Oceana, fishermen's associations, etc., all support this idea.

However, the implementation of limited entry systems implies that some people will be left out and inevitably, some of these will be birthright members of the fisheries institution. These are the people who will be hardest hit by limited entry systems and it is largely because of them that limited entry is such a contentious issue. Fishermen feel that the most dangerous thing about limited entry is that it attempts to solve fishery management problems by limiting individual freedom. 64

Both the economic and sociological consequences of limited entry raise the issue of equity. First there are those who are included versus those who are left out. From an economic perspective, the potential fishermen who are left out will do everything possible to get in. This means that agencies must decide how permits will be allocated as they become available. Allocation must be based on criteria, which are arbitrary, and exceptional cases always exist. Equitable distribution of permits thus becomes extremely difficult. The reality is that no way exists for there to be total equity with limited entry; although there is little question that the present system of fisheries management lacks equity as well.

There may also be serious biological consequences of limited entry systems. A broad consensus exists in the
U.S. that license limitations by themselves do not effectively prevent biological overfishing and that traditional management measures must be applied to address resource conservation needs. In fact, moratoria often increase the number of effectively participating fishermen. For example, speculative behavior is initiated with licensing systems because, like taxi medallions or liquor licenses, value is placed on licenses. Also, fishermen's concern that they will lose their licenses by not fishing either forces them to fish or to submit false catch reports. Fishermen feeling compelled to fish increases effort, and submission of false catch reports raises havoc with the collection of accurate statistics.

The ultimate decline of Georges Bank fish stocks after implementation of the Magnuson Act demonstrates this consequence. After the number of foreign vessels was reduced, U.S. fishermen, with the aid of U.S. government subsidy programs, rapidly expanded their effort. At the same time, the New England Fishery management Council was unable to cap or reduce effort on Georges Bank stocks. This has resulted in the continued poor condition of the haddock stocks, and the rapidly deteriorating condition of other important finfish stocks.

Abridging the freedom of entry or exit also has political consequences. In evaluating a limited entry proposal, legislators look for provisions that preserve free enterprise. If freedom of entry and exit has not been
adequately addressed, it is likely that legislative committees will add appropriate provisions regardless of their effect on the rest of the scheme's design. Also, those that are left out will inevitably confront their legislators. If the system has been well designed, with effective entry criteria and appropriate mechanisms for dealing with disputes, then politicians can tell their constituents as much. However, if the system is poorly designed or administered, legislators will react to criticism about the scheme and act to change or repeal it. 66

Given the administrative theory behind limited entry which is that the costs of regulation are higher with many fishing units than they are with fewer units, virtually any fishery that has a high number of participants with respect to the available fish will be difficult and expensive to manage. 67 Ideally, therefore, limited entry systems will aid management. However, there are consequences to limited entry systems that can have profound affects on management. For example, with licensing systems criteria for hardship and transfer applications must be set by the management agency. Provision must also be made for grievances of the hardship and transfer procedures. With stock certificate programs or with individual fisherman's quotas, the quotas themselves must be designed and administered. In fact, any type of limited entry scheme, not to mention any new management policy at all, will create a new set of
administrative problems.

Another administrative consequence of limited entry programs is the seepage effect.\textsuperscript{68} If controls are put on inputs into a fishery such as total number of boats, then licenses may be transferred to larger vessels, or if there is a limit on the size of vessels, then more efficient nets may be employed. In other words, fishermen are motivated to get around the intent of regulations by increasing their individual efficiency. Administratively, this causes the implementation of regulations designed to counter these increases in efficiency. The resulting regulatory move is countered by an industry move which, in turn is countered by another regulatory move; thus the seepage effect.

The seepage effect has occurred in the British Columbia limited entry program. Original limits on the number of vessels were replaced by tonnage limits when fishermen transferred licenses to larger vessels. Reductions in the number of vessels imposed by regulation were then countered by increases in seine gear efficiency.\textsuperscript{69} Similar events occurred when limited entry and other regulations were imposed on the mid-Atlantic surf clam fishery.\textsuperscript{70} In short, when limitations on inputs into a fishery are contemplated in limited entry, it is necessary to be aware of, and attempt to counter, the seepage effect.

\textbf{Conclusions}

This chapter reviewed limited entry and compared it with traditional management, thus establishing where
limited entry lies in the scheme of fisheries management. New fishery management methods are sought only when there are clear indications that current systems are deficient in their ability to conserve fish stocks and maintain an economically secure environment for fishermen; these indications are prevalent in modern fisheries management.

Is is because of this that limited entry should be reviewed carefully as an alternative fishery management policy, and applied where necessary.

Limited entry is probably the most drastic of the alternatives to the traditional fisheries management system because it calls for a change in attitude for managers and users alike. By limiting entry, government is proclaiming that resource use is a privilege and no longer a right.
Notes


2 Ibid.


5 Huppert, 1986, p. 4-5.


7 Huppert, 1986, p. 5.

8 Ibid., p. 5.


10 Ibid. p. 743.


12 Crutchfield, 1979, p. 742.


16 Ibid., p. 6.

17 Peterson, You Can’t Do It Alone.


19 Huppert, 1986, p. 3.


21 Ibid.

22 McConnell and Norton, 1978, p. 188.


26 Huppert, 1986, p. 9.

27 Ibid., p. 10.


29 Huppert, 1986, p. 3.

30 Ibid., p. 2-3.


40 Ibid., p. 5.

41 National Fishermen, August 1985.

42 Ibid.


47 Crutchfield, 1979, p. 743.


54 Huppert, 1986, p. 11-16.

55 Ibid.

56 National Fishermen, August 1985.


58 Representative Robert Gillette, interview held in Pembroke, Massachusetts, March 26, 1987.


60 Ibid.


62 Matsuda, 1979, p. 54-57.

63 Townsend, 1985, p. 2050.

64 Matsuda, 1979, p. 1.


66 Representative Robert Gillette, interview held in Pembroke, Massachusetts, March 26, 1987.


69 Ibid.

70 Personal Communication, David Pierce, DMF.
CHAPTER II

LIMITED ENTRY PROGRAMS IN THE UNITED STATES

Introduction

Limited entry programs for the management of marine and inland fisheries are presently in effect in nine states. In addition, the Mid-Atlantic Fisheries Management Council utilizes limited entry as one tool in its surf clam and ocean quahog fisheries management plan.

The states which have limited entry in their fisheries are Alaska, Washington, Oregon, California, Minnesota, Wisconsin, Michigan, Ohio and Massachusetts. This chapter will summarize each one of these programs but certain common elements should be noted in advance. First, each of these plans is license type limited entry that started as a moratorium on entry. Second, all of these plans were implemented within ten years of one another, and most were implemented between 1973 and 1979.

This chapter summarizes each of the aforementioned programs. An important conclusion is that these programs demonstrate that limited entry, by itself, does not conserve fisheries resources.

Alaska

Three attempts were made to pass limited entry legislation in Alaska before a law was finally enacted.
The first two attempts were in the 1960’s and were both found unconstitutional by federal courts because they discriminated against non-Alaskan U.S. citizens.

There were several reasons why Alaska wanted to implement limited entry management in its fisheries. In the 1960’s Alaska began to experience increased numbers of commercial fishermen and rapidly decreasing resource levels. This resulted in a decline in the health of the Alaskan fishing industry. The state was also very concerned about the depressed condition of its salmon runs which, in many areas, were reduced to critical low levels, threatening the continuation of the salmon industry. Another important reason was the desire to preserve fishing opportunities for Alaska’s rural residents who were slowly being pushed out of the fishing industry by larger commercial operations. As a result of these concerns, Alaskan fishery managers believed that effective resource management had become essential, and limited entry had to be utilized.¹

In August of 1972, Alaskans voted to amend the state constitution to allow the state "to limit entry into any fishery for purposes of resource conservation, to prevent economic stress among fishermen and those dependent upon them for a livelihood, and to promote the efficient development of aquaculture." The stated purpose of the law was to promote "the conservation and sustained yield management of Alaska’s fishery resource and the economic
health and stability of commercial fishing in Alaska by regulating and controlling entry into the commercial fisheries in the public interest and without unjust discrimination." Passage of this law created the first comprehensive limited entry program in the U.S.. It was carefully designed to avoid explicit discrimination against non-Alaskan U.S. residents and the creation of a closed class of fishermen.

The limited entry act created the Alaskan Commercial Fisheries Entry Commission, consisting of three full time members, and acting as a quasi-judicial regulatory body. The Commission is in charge of implementing and administering the limited entry program and its primary responsibility is the adjudication of license applications. The Commission has specific authority to limit the amount of gear in each fishery (through the limitation of licenses as opposed to using traditional methods) so as to stabilize each fishery thereby providing reasonable economic returns for fishermen. The Commission also aids in effective fishery management and promotes the development of professional and diversified commercial fisheries. 

The program is a license type limited entry program with licenses being assigned to vessel skippers. The Commission lacks authority to implement traditional effort limitation programs to supplement limited entry. Fisheries may be limited by the Commission whenever it concludes that such action will serve the purpose of the statute. For
purposes of limiting entry, fisheries are defined by species, gear type and area. As a result, licensing systems are set up for different species, for the same species by different gear type, and for the same species by area.

License limitation is a two stage process. In the first stage, the Commission looks at a fishery to assess recent participation levels and determine the economic dependence of fishermen. Based on this information, it will declare the maximum number of gear units (licenses) to be allowed. This maximum number of gear units usually corresponds to a significant reduction in the number of potential participants because the grandfathering provisions of this law are quite strict. Permits are issued based on a point system where points are assigned using degree of economic dependence on the fishery and extent of past participation as criteria. Licenses are freely transferable for fishermen who rank high on this point system. However, licenses are not transferable for fishermen who are awarded less than a certain point value. That is, fishermen who rank as having minor economic dependence on a fishery cannot transfer their licenses. 4

The second stage of this system consists of reducing the number of fishermen in a fishery through a vessel buy-back program. To do this, the Commission determines the optimum number of gear units. If this optimum number of gear units is less than the actual number of gear units, a
buy-back program is implemented so that the optimum number of vessels is reached in ten years. Vessel buy-back programs are funded by a tax of up to seven percent of each permit holders gross earnings. The Commission is directed to pay the fair market value for permits, vessels and gear. The second stage of the Alaskan limited entry system has never been implemented because the Alaskan Attorney General determined that parts of this program are unconstitutional.⁵

There are 37 regional fisheries in Alaska presently under the limited entry system. These include all of the salmon fisheries, most herring fisheries, the northern and southeast sable-fish fishery, the southeast king crab fishery and the southeast tanner crab fishery.

Proponents of the limited entry program believe that it has decreased harvest and management costs. They also claim that the program has stabilized entry into the salmon fishery as salmon runs have returned and the fishery has become increasingly profitable. Valuable stocks have been protected without the need for harvest closure. Economic benefits to fishermen have increased, in part because of value that has accrued to the permits themselves. There is a decrease in regulatory uncertainty due to stable numbers of harvesters. Concerns for the gradual transfer of fishing rights from Alaskans to non-Alaskans have been unfounded.

Opponents of the Alaskan limited entry program believe
that it has been expensive to implement and administer. They also feel that it has failed to halt growth in excessive fishing effort and that it allows excess profits to go to the original permit holders. The costs associated with allocation of fishing rights have exceeded net economic benefits. The law promotes vessel specialization and is against free enterprise. They also believe that there has been a shift of licenses from rural to urban areas and from Alaskan natives to non-natives.

The program is well established now and is undergoing rapid growth and change in response to the changing needs of Alaska’s fisheries. However there are basic changes that need to be made in the program especially in the second stage. These changes would make this portion of the law constitutional so that buy-back programs may proceed. It is also believed that further changes in the law may be necessary before it expands into other fisheries. 6

Washington

The state of Washington has long realized that its fisheries are overcapitalized and has used, or attempted to use, limited entry in several of them. Controls for entrance into the oyster and subtidal hardshell clam fisheries have existed for some time although an attempt to limit entry into other Washington fisheries in 1934 was found unconstitutional by the State Supreme Court. The Washington Department of Fisheries began, in 1965, to work
full time for the implementation of a limited entry program, and by 1971 had received substantial industry support for this type of management. In 1973, a license moratorium was initiated in the Puget Sound herring fishery. In this program, transferable licenses were assigned to vessel operators.\(^7\)

In 1976, a licensing moratorium was implemented for salmon. The primary impetus for this program was the first in a series of federal court decisions allocating fishery resources to the Indians. As a result, local authorities were required to increase fishing opportunities to treaty Indians with subsequent regulations causing economic dislocation to non-treaty Indian and non-Indian fishermen. This decision placed the already overcapitalized salmon fishery in a crisis situation with extreme overfishing.\(^8\)

The 1976 moratorium began with the licensing of new salmon vessels. All existing salmon licenses were transferable and a separate buy-back program was initiated. In contrast to the Alaska program, initial qualifications for entrance into the fishery were quite permissive with virtually anyone who had caught one fish during the previous year being eligible to obtain a license.

The program’s objectives were to improve the economic health of the salmon fishery, and eventually, all other fisheries to be placed under limited entry. Fishery conservation commitments had to be met. The program also sought to stabilize fleet size and to mitigate increasing
catch potential. Compliance with Indian salmon allocations was also of concern. An implicit goal of all Washington limited entry programs was always one of equity.  

The program began with the establishment of a moratorium on the issuance of new licenses based on a previously determined upper limit. This limit could not be exceeded, and reduction of the number of licenses was to be achieved through attrition. In addition, a license would be lost if it was not used. The moratorium began the process of fleet reduction and the process was continued through a federally funded vessel buy-back program. 

Realizing that fleet reduction would be a gradual process, the State implemented indirect management regulations to conserve salmon stocks. These measures included limited seasons, gear restrictions, seasonal quotas and, when necessary, season closures. These measures were also necessary because the license system did not address vessel size and catch capacity. The process of fleet reduction through vessel buy-backs still continues. All licenses are freely transferable within each gear group and area. 

Other fisheries placed under license limitation schemes were commercial geoduck clams in 1979 and the dungeness crab fishery in 1980. 

During the past decade, the salmon fleet has been reduced by 23.4% using 20 million dollars in federal funds. However, the need for further limitation is evident. Also,
fears by some managers that producers from the overcapitalized salmon fisheries would move into the chub and bottomfish fisheries have been unfounded. On the other hand, the number of licensed fishermen rose during the first year of the program because of the lenient grandfathering restrictions, and the vessel buy-back programs have had no apparent impact on conservation or economic efficiency despite the 20 million dollars spent (one can only imagine the public outrage at this expenditure). It is also believed that the drastic decline in fleet size has been more due to decreased salmon market prices, increased operating costs and limited fishing opportunities than to the vessel buy-back programs.\textsuperscript{11}

**Oregon**

Impetus for limiting entry in Oregon came from a number of sources. The Boldt decision allocating salmon resources to treaty Indians in Washington raised fears that displaced Washington fishermen would move south to Oregon. There was concern by State fishery managers that the federal government would impose limited entry if it did not act first. Oregon salmon fishermen were already experiencing economic troubles, and there was concern that more fishermen, regardless of the source, would worsen the situation. There was also concern that displaced Gulf of Mexico shrimpers would move to Oregon en masse. In addition to these fears, overcapitalization in the fisheries coupled with decreasing stocks and the need to
accommodate Indians helped to trigger limited entry legislation. The main objective of the Oregon limited entry system was to improve the economic health of its fisheries while meeting its conservation goals.\textsuperscript{12}

The Oregon limited entry system consists of vessel license moratoria, called restricted participation systems. The first of these moratoria on the issuance of new licenses occurred in 1979 in the ocean troll salmon fishery, the Colombia River gillnet salmon fisheries and the pink shrimp fishery. Since then, moratoria have been implemented in the scallop and roe herring fisheries. Licenses are freely transferable in all limited fisheries except the ocean troll salmon fishery and the pink shrimp fishery. In 1984, restrictions were placed on transferring licenses to vessels of larger size in the ocean troll salmon fishery. In the pink shrimp fishery, permits may be transferred to replacement vessels or to the purchaser of a permitted vessel. All of these limited entry programs had liberal grandfather clause provisions so that, initially, the number of licensed fishermen increased. Eligibility to renew licenses is maintained by proof of landings. This requirement may be waived in the salmon fisheries to avoid intense fishing on stocks when abundance is low.

When these license limitations systems were implemented, a special fishing permit commission was created to adjudicate license eligibility appeals. The decisions of this board may not be reviewed by the Oregon
A modest buy-back program for salmon gillnetters was also implemented. This attempt to reduce the number of fishermen was due to a long historical decline in the river gillnet fishery. This decline was attributed to overfishing, the Indian treaty court decisions and environmental factors. The buy-back program worked by the reverse auction process using sealed bids from license holders. Licenses therefore, were bought back by the Fishing Permit Commission from the lowest bidders. A ceiling was placed on what the Commission was willing to pay. While this buy-back program was in effect, 170 offers were made by the Fishing Permit Commission, and 118 permits were purchased and retired. The buy-back program is now inactive.

Some of the consequences of limited entry in Oregon are as follows. Effort increased after implementation of these moratoria because of liberal grandfathering provisions. For the salmon troll fishery, there were approximately 3127 licenses when the license moratorium was implemented. This number increased to 4314 because of the grandfathering provisions. From 1980-84, the number of permits in this fishery decreased from 4314 to 3201. In the pink shrimp fishery, the number of permits decreased from 373 to 134 from 1980-84. In the scallop fishery, the number of permits decreased from 196 to 134 from 1981-84. A lottery for issuance of new licenses is available in the scallop
fishery but has not been used because the number of new permits to be issued cannot exceed 118. In 1988, there will be a lottery for new entrants into the ocean troll salmon fishery, but new permits cannot be issued to exceed 3158. In the pink shrimp fishery lottery, new permits cannot be issued to exceed 187. The roe herring moratorium was implemented in 1983. Eleven harvesters qualified for this fishery in 1984-85.

Stated benefits of these programs include reduction of competition among harvesters, a more orderly conduct of the fisheries, and a closer relationship between effort and the available resource. Those against these programs complain that they forclose free access to the fisheries and that market prices should be allowed to provide an indirect control over the number of harvesters.\(^{15}\)

**California**

There are numerous reasons why the state of California implemented limited entry legislation in the early 1970’s. Initially, public disturbance over the sudden emergence of a significant roe herring fishery in San Francisco and Tomalas Bays raised the fear that if this fishery was not regulated, it would be legislated out altogether. Late in the 1970’s, a similar situation occurred when a drift gillnet fishery for marlin was introduced. Like other Pacific coastal states, California was in need of restoring depleted stocks especially in the abalone, salmon, shark
and swordfish fisheries. Likewise, effort was on the rise in all of these fisheries and particularly in the abalone fishery. Also in the abalone fishery, there were excessive numbers of inexperienced divers who tended to disregard effort controls such as size limits that were intended to conserve the stocks. The Pacific Fisheries Management Council recommended in the early 1970's that Pacific coast state's limit entry into the salmon fisheries to counter a long term decrease in the salmon stocks, and to halt steady increases in effort in the salmon fisheries. California also felt regulation of entry into the gillnet fisheries would be one way of reducing marine mammal mortality from this gear type. Finally, limited entry was seen as a way to increase access in an experimental drift gillnet swordfish fishery.16

The objectives of all California limited entry programs can be summarized as follows. Their primary purpose is to enhance conservation and protect the commercial fishing industry. They are supposed to: aid in reducing the kill of marine mammals and birds, in particular by the gillnet fisheries; reduce the conflict between all fishing groups, commercial and recreational; and enhance the economic efficiency of the fisheries. Physical conservation and equitable allocation of all fish stocks are central to the State's conception of its role in managing the fisheries.

There are three types of limited entry programs in California. The first is called qualified entry. This
type is designed to make sure that all applicants are experienced in a fishery before they can operate a vessel in that fishery. The second is called entry moratorium. This type of entry control is designed to stop all new entry into a fishery and is viewed as a temporary step to setting up a limited entry program. The third type is limited entry itself. These programs set specific procedures and conditions for licensing new fishermen. For example, some limited entry programs set goals for the total number of fishermen or vessels to be allowed to participate.

Other programs control the conditions of entry. For example, no numerical goals were provided for by the California Legislature for the commercial salmon industry, but the Commercial Salmon Fishing Review Board and the Fish and Game Commission determine the number of salmon permits issued annually. In the abalone fishery, the Fish and Game Commission set a goal of 100 operator licenses.17

All California limited entry programs are licensing systems. Within all systems, virtually no transfer of licenses is allowed. The California Department of Fish and Game is against license transfer for several reasons. It is felt that when value accrues to a license, requiring substantial investment, resistance to regulations will develop. The tendency for windfall gains through the selling of licenses is also deemed undesirable by the State. High values to licenses create a discriminating
barrier to new entrants in that, only those who can afford the high priced licenses can enter the fisheries. Within these systems, however, license transfer is allowed to heirs and working partners. License transfer is also possible in the troll salmon fishery because licenses are attached to the vessels and therefore are transferred when the vessel is sold.\textsuperscript{18}

With the exception mentioned above, all licensing programs attach the licenses to the fishermen. Eligibility for them is based on past participation and evidence of substantial investment in vessel and gear prior to enactment of limited entry legislation. In the first year of a new limited entry program, fishermen become eligible for a license if they have twenty years of experience as a fisherman and at least one year in the specific fishery to be limited. Permits are renewed annually, and renewal is contingent on continued participation in the fishery. Permits may not be held by corporations or partnerships. As a limited entry program continues, allocation of permits occurs as they become available to applicants showing necessary past participation and experience qualifications. Selection for permits among equally qualified applicants is done through a drawing. Finally, licenses are limited by gear (general gillnet) or species/gear combination (salmon troll, abalone diver), or gear and area (drift gillnet).\textsuperscript{19}

There are currently seven fisheries administered with limited entry programs in California. These include the
herring roe fishery, the commercial abalone fishery, the salmon fishery, the general gillnet fishery, the drift gillnet fishery for shark and swordfish, the experimental drift gillnet fishery for swordfish off central California and the nearshore set gillnet and trammel net fishery off central California.20

Proponents of limited entry in California feel that the programs are adaptable to a wide range of circumstances, they can be implemented with various other regulations, and they can be tailored to each fishery. In addition, all of the limited entry systems provide means for new entry when permits become available while bureaucratic mechanisms for maintaining entry at desired levels has been established. Equity concerns are also addressed through generous grandfathering which allows virtually all past participants in with the initial allocations.

Detractors of the programs cite their use as political solutions to social conflicts as occurred with the herring roe fishery. There is also concern expressed about the effect of these systems on free enterprise and equity. Finally, there is concern that reluctance on the part of the California Legislature to consider economic efficiency in limited entry serves to the detriment of the programs.

Michigan, Minnesota, Wisconsin, Ohio

These four mid-western states are placed together because their limited entry programs share several common aspects. During the 19th century, the Great Lakes provided
a valuable fish harvest to the U.S. However, this fishery declined dramatically in the early and mid 20th century because of environmental degradation, invasion of the sea lamprey, pressures to reallocate fisheries resources to recreational fishermen and the assertion of Indian fishing rights.21

In the 1960’s, substantial cooperative efforts between the Great Lakes States and Canada led to rejuvenation of the Great Lakes fisheries with dramatic increases in commercial regulations. These cooperative efforts were used to shift a declining labor force towards increased participation by professional, fulltime fishermen with the hope of attracting qualified young people into the fisheries.22

Each state implemented limited entry programs at different times and places. Wisconsin imposed limited entry on Lake Superior in 1967, and on Lake Michigan in 1978. Minnesota implemented its Lake Superior limited entry program in 1977. Michigan began limited entry on Lake Michigan in 1968 and has since expanded the program to include Lake Superior, Lake Huron and Lake Erie. Ohio introduced limited entry to its Lake Erie fisheries in 1974. What follows is a detailed description of each state’s limited entry programs.

Michigan

Michigan’s primary objective in implementing limited
entry was to reduce fishing effort. In 1978, a ceiling of 188 licenses was placed on fishing licenses partly with the intention of eliminating part-time fishermen over several years. Currently all licenses are tied to vessels with specific ownership stipulations. License transfer is allowed and is administered by the fisheries management agency. Effort reduction is achieved by attaching the right to harvest fish and the provisions for harvest to individual harvester licenses rather than through general regulations and laws. Limited entry programs only effect non tribal fishermen - tribal harvests are not restricted by these programs. In 1975 a modified quota system for Lake Superior was implemented in which one half of the catch was allocated under the quota and one half was left open for competitive harvest. Also, in 1975, a quota shares system was set up for chub. By early 1986, there were only 110 commercial licenses issued.23

Following the imposition of limited entry, commercial fish stocks have improved to almost historically high numbers. In addition, individual harvester profits have returned to more reasonable levels and license control appears to enhance effective management. Limited entry has reduced commercial versus sport fishing conflict.

On the other hand, there have been enforcement problems because of the lack of laws and regulations aimed at effort reduction. Since stipulations are only attached to licenses, violators cannot be arrested. Also, it is
believed that limited entry helped to precipitate the Indian fishing rights crisis by displacing Indian harvesters in the early 1970's. This resulted in fifteen years of litigation which ended in favor of the Indians. Now the State must reduce the number of commercial harvest licenses by an additional thirty operators to accommodate the tribal harvest. In addition, there is a reporting problem with the Indians in that, of the 500 fishing cards issued, only 60-70 report on a monthly basis.\textsuperscript{24}

\textbf{Minnesota}

In Minnesota, licenses are available to those who possess more than a minimum amount of gear, have fished more than a set number of days during the previous season and have sold fish exceeding a certain value during the preceding year. New entrants are allowed into the fisheries only if proof of purchase or inheritance of gear and facilities from an existing license is provided. Entrance can also be achieved if an applicant has two or more years of experience as a helper to an existing permit holder. Additional restrictions are also in effect. These regulate the total amount of gear which may be fished for herring, cisco and chub. For example, the total footage of gillnet allowed is less than or equal to 100,000 feet for herring and less than or equal to 120,000 feet for cisco and chub. The total footage of gillnet that an individual operator may use is less than or equal to 2,000 feet for herring and less than or equal to 12,000 feet for cisco and
Wisconsin

The Wisconsin limited entry program was designed to establish equity and for resource conservation subject to constraints on administrative feasibility. Economic efficiency was not defined as an important goal by the State. Limited entry was implemented in 1968 for lake trout and five other species. Initially, sixty-eight non-transferable licenses were authorized. These authorizations were based on residency requirements, past fishing record, fishing and navigation ability and the quantity and quality of the equipment possessed. The number of licenses authorized was reduced to 58 in 1970 and further reduced to 21 in 1972. The number of licenses was again reduced to 19 in 1977. Licenses are tied to vessels in this program with specific ownership stipulations attached. A similar program was implemented for Lake Michigan in 1978. This program was accompanied by sharply increased license fees to remove part time fishermen from the fisheries. There seems to be a consensus of opinion that both the Minnesota and Wisconsin programs have enhanced effective management and reduced commercial and commercial versus recreational conflicts.26

Ohio

In Ohio, equity and resource conservation were stated goals of the limited entry program and, again, economic
efficiency was not stated as an important goal. In 1974, four fish species were placed under limited entry. They were walleye pike, yellow perch, white bass and channel catfish. Permits were awarded to fishermen based on passed experience in the fishery, and permit and royalty fees were dramatically increased. For example, in the trap-net fishery, the license fee increased from $80 to $800 per year. The purpose of these increased fees was to aid in reducing the number of harvesters from approximately 350 to 150. Permits are transferable through the Ohio fisheries management agency.

In 1980, the Lake Erie fisheries were further restricted. At this time, legislation mandated that the state buy-back all commercial gillnet licenses. Gillnetting was then made illegal. Limited entry appears to have improved the recreational fisheries harvest in Lake Erie, and there appears to have been some stock recovery for yellow perch due to the absence of gillnets. There also seem to be reduced gear conflicts between commercial and sports fishermen. On the other hand, some contend that elimination of the gillnet fishery prevents full utilization of Lake Erie resources.27

Mid-Atlantic Surf Clams

The mid-Atlantic surf clam management plan includes a license moratorium and, as such, is the only plan promulgated at the regional level that employs limited
entry. During the mid 1970’s there was a biological crisis in surf clams due to excessive fishing capacity in this fishery. In addition to this, the surf clam stocks off the New Jersey coast had suffered from anoxic conditions during 1976. It was estimated that 25% of New Jersey’s offshore stocks were destroyed by this condition. Concurrent with these events was the passage of the Magnuson Act in 1976, and the creation of regional fishery management councils. The Magnuson Act thus created an appropriate avenue for regional management of mid Atlantic surf clams at a time when all parties agreed that recovery of the stocks would require effective control over excessive fishing capacity.28

The Mid-Atlantic Fisheries Management Council chose a wide range of management tools to fulfill three objectives. These objectives were to: 1, rebuild surf clam populations to MSY levels (at that time MSY was considered to be 50 million pounds), 2, minimize short term economic dislocation and 3, prevent continued excessive harvest of ocean quahogs. The tools to be used included a moratorium on entry into the two fisheries, quotas, time and area closures, licensing of fishermen, record keeping systems for fishermen and processors and vessel marking requirements. Limited entry, through the license moratorium, was considered because of the major management problems facing the Mid-Atlantic Council which required the use of just about every management option available at the
time. Limited entry was also considered because excess capacity in the fleet was so pronounced that economists predicted the annual yield in the surf clam fishery could be achieved by the fleet in fifteen days.\textsuperscript{29}

The initial mid-Atlantic surf clam management plan did, in fact, make use of most all the tools mentioned above. Licensing was established for all vessels taking surf clams and ocean quahogs. A moratorium on entry into the surf clam fishery was implemented with licenses attached to vessels. Other effort restrictions were also put in place. These included quotas, shortened work weeks, adjustments in the number of fishing days to be allowed, area closures to protect small clams, reports and record keeping for fishermen and processors and vessel marking. This plan had a two year duration. The vessel license moratorium for the surf clam fishery had a duration of one year but could be extended for an additional year.\textsuperscript{30} In 1978, the first full year of the plan, a regulatory amendment was made that, among other things, extended the vessel license moratorium for an additional year.

In 1979, Amendment I for the entire plan was enacted. This amendment included New England in the vessel moratorium for surf clams. The New England Council and other New England fisheries interests expressed great concern over this provision of the plan since the original plan had appeared to exempt the New England area from this measure. As a result, the moratorium was lifted for New
England in Amendment II, implemented in 1981. In addition, revisions were made to the moratorium to make it less difficult to sell licenses to new operators and to leave the fishery.

Amendment III added three additional objectives to the plan. These were to provide greater freedom and flexibility to harvesters, to optimize yield per recruit and to increase the understanding of the stocks and the fishery. Amendment III also presented, for the first time, a full fledged limited entry program that would work through vessel allocations. This amendment included a five year program to reduce the number of licenses by allowing only one permit to be issued for every four that were retired. In addition, there would be minimum landing requirements necessary to keep licenses from being retired. The limited entry, vessel reduction and minimum landing requirement provisions of this amendment were not approved. No further attempts to modify the vessel license moratorium or change it into a permanent limited entry system were made in amendments IV–VI.31

With the exception of the vessel replacement provision, the moratorium has not been difficult to administer. The vessel replacement provision requires an administrative determination that a vessel left the fishery involuntarily during the moratorium, that the replacement vessel was essentially of the same harvesting capacity as the vessel it replaced and that the owner of the replacement vessel
owned the vessel that was lost. Unfortunately, all three of these requirements are subject to interpretation which is why this provision has been difficult to administer.³²

Other difficulties with the vessel license moratorium are as follows. The license program created a new demand for licenses as illustrated by the New England surf clam industry. When the permit program was extended to this area, hundreds of permits were issued even though only a handful of operators actually participated. The licensing program, by itself, has no direct effect on conservation.

The vessel moratorium was initially intended to last only one year with the possibility for a one year extension. At that time, the conventional wisdom from industry, NMFS, and other management agencies was that the moratorium would quickly be replaced by a more permanent limited entry system, most likely in the form of vessel allocations. This initial optimism was obviously misplaced since over eight years have passed since initial implementation and the moratorium is still in place.³³

Massachusetts

There are presently three limited entry programs in effect in Massachusetts. They are the commercial inshore lobster fishery, the bluefin tuna purse seine fishery and the trawl fisheries for winter flounder in bays and estuaries. All of these programs incorporated provisions to grandfather established harvesters while limiting the number of new entrants. However, there were no buy-back
provisions for any of the programs and, with the exception of the lobster licensing program, transfer of permits was not allowed. This latter provision was designed to prevent permits from accruing value. Effort in all of these fisheries, with the exception of the commercial inshore lobster fishery, has successfully been reduced, partly as a result of these programs.34

The Massachusetts inshore lobster fishery license moratorium was first implemented in July of 1975 and placed a cap of approximately 1300 on the number of fishermen in the inshore lobster fishery. Inshore is defined as anywhere within the three mile state, FCZ boundary line. It was intended that this moratorium be temporary, and studies on the feasibility of different limited entry options were mandated by law during the moratorium's first year. The long term objectives of this law were to improve the economic efficiency of the inshore lobster fishery by stabilizing the number of lobstermen who operated inshore, to reduce the number of part time lobstermen, and to promote conservation of inshore lobster stocks. The study never reached any useful conclusions and the moratorium remained in place until 1980.

In 1980, the original moratorium was repealed and replaced with a more permanent limited entry-type scheme which remains in effect today. The new law serves to reduce the rate at which the number of licenses increases in the inshore lobster fishery rather than to actually cap
or reduce the total number of licenses. Under the new law, eighty permits may be issued by the Director of the Division of Marine Fisheries per year to those applicants who are considered to be experienced and qualified to enter the coastal lobster fishery. An additional twenty, so called, special additional licenses may be issued per year to those who can demonstrate substantial hardship by not obtaining a lobster permit. There are now 1865 commercial inshore lobster permits.

Many problems were created for all concerned by the implementation of these two laws. Most of the problems in the inshore lobster fishery that these laws were supposed to remedy are as severe today as they were in 1975. In brief, the Massachusetts inshore lobster fishery is severely overcapitalized, and the lobster resource is fully exploited. The remainder of this thesis will focus on and analyze every aspect of these two laws. These analyses will reveal directions that management may take to improve this difficult situation.
Notes


3 Synopsis of Alaska’s Limited Entry Program, p. 1.

4 Schelle and Muse, Fishery Access, p. 320.

5 Ibid., p. 321.

6 R. Bruce Rettig, "Overview," in Fishery Access, p. 28.


11 Jelvic, Fishery Access, p. 316.

12 Rettig, Fishery Access, p. 25.

13 Ibid.


17 Ibid. p. 301.

18 Huppert and Odemar, Fishery Access, p. 302-11; and Rettig, Fishery Access, p. 24-25.
19 Huppert and Odemar, Fishery Access, p. 303.
22 Rettig, Fishery Access, p. 23.
23 Buck, 1986, p. 8-12.
24 Ibid. p. 8.
25 Ibid. p. 10.
27 Ibid.
29 Bruce Nichols, Fishery Access, p. 276.
30 Ibid. p. 276-77.
31 Ibid. p. 277-282.
32 Ibid. p. 284.
33 Ibid. p. 288; and Rettig, Fishery Access, p. 23.
CHAPTER III

THE LEGISLATIVE HISTORY OF THE INSHORE LOBSTER
FISHERY LIMITED ENTRY PLAN

Introduction

This chapter reviews the legislative history of the Massachusetts lobster license moratorium without any of the complicating factors that are inherent in a description of the politics of the law. A detailed overview of the politics that led to each action will follow in chapter IV. The purpose of writing a "bare-bones" history of this legislation is twofold. First, it is hoped that a prior familiarity with what happened with this legislation will aid in sorting out the political history that follows in chapter IV. Second, this chapter will provide a reference for those who need only to obtain a quick overview of the law.

Up to 1975

As will be seen in chapter IV, the lobster license moratorium legislation was filed and passed in a very short period of time. Evidence to this effect appears in a memo by then DMF Director Frank Grice on proposed legislation for 1975. In this document, the only reference to limited entry occurs in the statement that legislation should be
filed "to allow the Director of the Division of Marine Fisheries to restrict the number of commercial fishing permits issued annually in order to protect the resource and provide for adequate economic benefits to the involved fishermen".\textsuperscript{1} The lobster moratorium bill evolved from this proposed legislation in combination with a perennial bill, filed by the Massachusetts Lobstermen's Association, that would limit the number of commercial permits issued to 1000.\textsuperscript{2}

\textbf{1975}

During the first week in July 1975, the original inshore lobster license moratorium, House 5677 (H-5677), "An Act Further Regulating the Issuance of Commercial Fishermen Permits for the Taking of Lobster in Coastal Waters," was enacted by the legislature. Prior to July 10, a Request for Position on enacted legislation regarding H-5677 was submitted to DMF by the Governor's legislative office for review and comment. DMF Director, Frank Grice, prepared this report and concluded with the Agency recommendation that the Governor sign H-5677 into law.

H-5677 was approved and implemented by Governor Dukakis on July 14, 1975. The lobster license moratorium law appeared as Chapter 484 in the Acts and Resolves of Massachusetts, 1975 and amended Chapter 130 of the General Laws of the Commonwealth of Massachusetts by adding section 38B. There was also an emergency preamble in Chapter 484 that waived the normal ninety day waiting period between
enactment and implementation; the law went into effect immediately (see Appendix A).

Chapter 484 restricted the number of commercial lobster permits that the DMF director could issue per year to 1300 but gave him the discretionary power to issue up to 130 additional permits. These 130 additional so-called "hardship" permits were to be granted, subject to the approval of the Marine Fisheries Advisory Commission, to commercial lobstermen who had been issued a license since 1970 but for some reason had not renewed, or to applicants who would suffer substantial hardship if they did not receive a permit.

In addition, the law allowed for the transfer of licenses held by an individual, partnership or corporation to another qualified individual, partnership or corporation if the director determined that the transfer was in the public interest. An applicant who was denied a transfer or hardship could appeal to MFAC whose decision on the matter was final. In case of death, the executor or administrator was given authority over the permit until it expired.

Chapter 484 also directed DMF to investigate regulatory methodology for the development of a limited entry system and for the development of a gear limitation system. The Division was further directed to report to the general court its recommendations and the results of the investigation and study by the first Wednesday of December, 1975. Chapter 484 therefore established a lobster license
moratorium and directed that DMF conduct a study in order to determine how best to implement a permanent limited entry and gear limitation system for the coastal lobster industry.

Immediately upon implementation of Chapter 484, a major problem arose in that there was no provision within the law that specifically protected currently licensed commercial lobstermen from losing their licenses at years end. That is, there was no "grandfather-clause". As the law read, the DMF Director was required to issue 1300 hundred licenses per year with no guidance or restrictions on who those permits would be issued to. Therefore, he could issue the 1300 licenses to whomever he wished regardless of whether or not they had held a license during the preceding year.

As a result, emergency legislation to amend Chapter 484 was filed in the fall of 1975 as H-6755 "An Act Further Regulating The Issuance Of Commercial Fisherman Permits For The Taking Of Lobsters In Coastal Waters". Legislative committee hearings for this amendment took place on November 4 and on December 8, 1975 the new bill, Chapter 729, was signed by Governor Dukakis.

Specifically, the amendment provided that the director may give priority to applicants who held a lobster permit and who had fished for lobsters during the preceding year (see Appendix A). Note that the use of the word "may" in the amendment gave the director discretionary power over
the issuance of the 1300 licenses. Note also the phrase "who had also fished." This came to be known as the "must fish provision" of the moratorium. Again, because of an emergency preamble, this law went into effect immediately.

1976-1979

Although a great deal did occur administratively over the period from 1976-1978, very little legislative action took place concerning the lobster license moratorium and no action was taken by the legislature to either repeal the law or to formalize a limited entry system. During this period, three lobster license bills seeking to repeal the moratorium were written. The first of these was filed in 1976 as H-3081 "An Act Repealing The Law Limiting Commercial Lobster Permits". H-3081 was given an unfavorable review by DMF and was not passed by the legislature. The other two bills were filed in 1977, one as Senate 859 (S-859), "An Act Eliminating The Numerical Limit On Commercial Fisherman Permits For The Taking of Lobsters," and the other, H-4321, "An Act Prohibiting A Limitation On The Amount Of Permits To Be Issued To Commercial Fishermen For The Taking Of Lobsters In Coastal Waters". These bills were also given an adverse report by DMF and neither bill was passed by the legislature.

One common element to these three attempts to repeal the lobster licensing moratorium was that the petitions for each of these bills came from one or two people. Such
bills are rarely given as much credence by the legislature as bills that result from large petitions or that are filed by state bureau's.\(^3\)

One other bill was filed in 1977. This was H-2030, a bill to provide for a study of the lobster license moratorium issue, which was given a favorable report by DMF. No legislation concerning the lobster license moratorium was filed in 1978.

In 1979, several lobster licensing bills were brought before the legislature. The first of these was H-4600, "An Act Restoring A Measure Of Free Enterprise To The Lobster Industry", which was another attempt to repeal the moratorium. This bill was given an adverse report by the Committee on Natural Resources and Agriculture (CNRA).

In early 1979, H-3345, "An Act Providing For A More Limited Distribution Of Commercial Lobster Permits," was filed by Representatives Silva and Gillette for the Massachusetts Lobstermen's Association (MLA). H-3345 provided that the first paragraph of section 38B as amended by Chapter 729 of the acts of 1975 be struck out and replaced with the following: The 1300 permits issued would be reduced by 75% of the unrenewed commercial licenses each year. The 25% of unrenewed licenses remaining would then be made available to new applicants. MFAC could be given the responsibility for distributing this 25%.

This act sought to place more stringent provisions into the lobster license moratorium relative to the conditions
and requirements for the issuance of commercial lobster permits. H-3345 was an MLA attempt to reduce the number of lobster licenses to approximately 1000 over several years.\textsuperscript{4} The bill was opposed by DMF and killed by CNRA.

In May, 1979 H-6352, "An Act Providing For Certain Categories Of Permits For The Commercial Taking Of Lobsters," was filed by Representative MacLean for DMF. This was the first DMF proposal for a major revision of the lobster license law since the implementation of the original moratorium.

H-6352 called for striking out section 38B as amended by Chapter 729 of the acts of 1975, and replacing it with a two-tiered licensing system. Under the new section 38B proposed by H-6352, the DMF Director could issue a class A lobster license to any person who demonstrated that he had caught at least 5000 pounds of lobster in any of the three years prior to implementation. All other lobstermen would be eligible for a class B permit. After the first year, the Director could issue a class A permit to any class B permit holder who demonstrated that he had caught at least 3000 pounds of lobster during the previous year. Under both circumstances, the Director would be given discretionary power over the issuance of permits.

Class A permit holders would be able to transfer their licenses only to class B holders who had held their license for at least one year. Class A licenses would be renewed only if a fisherman could prove he had caught at least 5000
pounds of lobster during any one of two preceding years.

All class A and B license holders would be required to submit yearly catch reports and would be subject to having their licenses temporarily revoked if it was discovered, through random audit, that their catch report had been falsified. Lobster buyers would also lose their dealers license if they falsified weigh-out slips.

The DMF Director would have been required to implement regulations limiting the number of traps that could be used by class A and B permit holders. Violators of the provisions of H-6352 would be punished by fines. The law would have taken effect on 1 January, 1980.

H-6352 generated a great deal of controversy in both the fisheries management community and the lobster industry. This resulted in the introduction of a plan to gradually phase the lobster license moratorium out. Nevertheless, H-6352 was scheduled to go before public hearing with CNRA on June 5. Prior to June 5, DMF submitted a redraft of H-6352 to CNRA which proposed a phaseout of the moratorium on lobster licenses. A CNRA researcher stated that the redraft did propose a phaseout of the lobster license moratorium and that the Commonwealth would be back to a free entry system in the next five or six years.5

On June 7, CNRA reviewed H-6352 and recommended that an accompanying order, H-6426 ought to be adopted. H-6426 authorized CNRA to study the subject matter in H-6352 and,
if necessary, to hold public hearings concerning the lobster licensing issue. CNRA was to report its findings and recommendations to the House of Representatives by 1 August, 1979. This action effectively killed H-6352 and allowed CNRA to research a new bill.

In preparation for an August 1 deadline imposed by H-6426, the CNRA subcommittee assigned to study the lobster licensing issue met on July 30 "to draft a new bill on the methodology to be used for the distribution of commercial lobster permits." This study produced drafts of a new bill, still numbered H-6426, which was never formally submitted to the legislature. H-6426 called for a gradual phaseout of the license moratorium and was entitled: "An Act Providing For The Distribution Of Commercial Fishermen Permits For The Taking Of Lobsters In Coastal Waters". Study, debate and compromise relative to H-6426 consumed the remainder of 1979.

1980

In February of 1980, the redraft of H-6352 was re-filed as H-2077. The change in bill number indicates that the bill was re-submitted to the General Court during the next year. DMF described H-2077 as, "the old compromise lobster licensing bill that was a late file by the Division last year." The bill had, in 1979, been the Division replacement for the two-tier system of lobster licensing (H-6352), and called for the gradual phaseout of the moratorium by issuing 150 new permits per year off a random
catch reports or applications. The bill was given a favorable review by DMF, and was supported by the Massachusetts Lobsterman’s Association. DMF recommended that this bill become effective on January 1, 1981.

For the next several weeks, CNRA reviewed both H-2077 and H-5211, and on May 21, 1980, recommended that a new bill ought to pass. This bill was H-6544, "An Act Providing for the Distribution of Commercial Fishermen Permits for the Taking of Lobsters in Coastal Waters". H-6544 was passed by the legislature and was enacted by Governor Dukakis on July 10, 1980 as Chapter 444 of the Acts of 1980. (see Appendix A) Chapter 729 of the Acts of 1975 had been repealed and was replaced by a gradual phaseout of the lobster license moratorium.

Chapter 444 was enacted with an emergency preamble that indicated that the law would go into effect immediately, although Section 2 of the Act was to go into effect on December 1, 1980. The law amended Chapter 130 of the General Laws of Massachusetts by striking out section 38B as amended by Chapter 729 of the acts of 1975 and replacing it with the following provisions.

During the period from December 1 to March 1 of each year, the DMF director was instructed to renew existing commercial coastal lobster permits to those who had held them during the previous year. From January 1 to March 1, 1981, new applicants could apply for permits. These applications were to be made by registered mail to the
division and then were to be acted upon, in order of receipt, by the director.

The director then was to separate the unqualified applicants from those who were qualified, by experience, to enter the coastal lobster fishery. The qualified applicants would be placed on a list by random selection, then the unqualified applicants would be placed randomly on the same list. Future applicants would be placed on the list in consecutive order following the unqualified applicants. This list was to be maintained by the director and updated as necessary.

The director was further instructed to issue no more than 100 permits for 1981 and no more than 80 permits for each subsequent year to applicants (from the list) who were determined to be experienced and qualified to enter the coastal lobster fishery. The criteria for determining qualified applicants were: 6 months experience in the coastal lobster fishery or 12 months full time experience in other fisheries or a combination thereof, and applicants must show a commitment to participate in the coastal lobster fishery.

The director was then allowed to issue, "the director may issue," up to 30 permits in 1981 and up to 20 additional permits for each subsequent year to so called special additional cases. These were individuals who could demonstrate previous employment as a commercial coastal lobster fisherman, that most of their income had come from
this profession, and who could show compelling reasons why they had not renewed their permits on time. Criteria for making these determinations were to be made by MFAC.

Appeals for special additional and transfer decisions were to be made to the commissioner of the Department of Fisheries, Wildlife and Natural Resources whose decision would be governed by the MFAC criteria and would be final. All commercial coastal lobster fishermen were to document their catch and supply this information to DMF. These catch reports were to be kept confidential. Fines would be imposed on those who either filed incomplete catch reports or falsified their reports.

Commercial coastal lobster license holders could transfer their permits to members of their immediate families or to lawful members of any other type of business enterprise or legal entity provided the entity had been in a lawful partnership with the license holder for more than one calendar year. The entity to which the permit would go had to be experienced and qualified to enter the commercial coastal lobster fishery. The director was allowed to develop transfer criteria. Section 2 of Chapter 444, which was the lobster licensing section described above, was to take effect on 1 December, 1980.

1981 - Present

In January, 1981, Chapter 444 of the Acts of 1980 was amended by the enactment of S-2431. This bill became
Chapter 769 of the acts of 1981. (See Appendix A) Chapter 769 deleted the word 'additional' from the special additional provision of the law. In Chapter 444, the second paragraph read: "The Director may issue up to thirty permits in nineteen hundred and eighty-one, and twenty additional permits for each year thereafter, to those individuals who have been previously engaged in commercial fishing . . ." This meant that in 1981, the Director could issue thirty special additional licenses and that for each subsequent year, he could issue fifty special additional licenses. Deletion of the word "additional" from the second paragraph limited the Director to issuing only twenty special additional licenses for each subsequent year as was originally intended. This was the only amendment to Chapter 444.

Over the next six years, several attempts to change or repeal the new coastal lobster licensing law were made. In 1981, four additional bills were filed in the House of Representatives. The first, H-1587, "An Act Repealing the Moratorium on Issue of Commercial Lobster Permits," was another attempt to repeal the lobster license moratorium. DMF opposed this bill because it sought to repeal a law that had already been repealed.

The second, H-3248, "An Act Providing for the Distribution of Commercial Fishermen Permits for the Taking of Lobsters in Coastal Waters," attempted to eliminate the requirement established in chapter 444 that applicants must
have prior experience in order to be eligible for a commercial lobster license. Since DMF considered past experience a necessary factor in ranking applicants it opposed this amendment.

The third, H-2352, "An Act Providing for the Issuance of Commercial Lobster Licenses," would have amended Chapter 444 by requiring that substantial hardship or need for a permit be determined by MFAC. According to DMF, this would have perpetuated one of the main administrative problems of the original moratorium, namely, that the MFAC had been required to spend too much of its time evaluating hardship applications.

The fourth bill, H-4742, "An Act Providing for Two Hundred Additional Permits for the Taking of Lobsters in Coastal Waters," would have amended Chapter 444 by allowing for the issuance of 200 permits in 1981 rather than the original 100 called for by the law. The Division was against all legislation, other than corrective legislation, that would substantially amend Chapter 444 and thus opposed this bill.

There were three attempts to amend Chapter 444 in 1982. The first of these, H-1196, "An Act Further Regulating the Provisions for the Issuance of Commercial Lobster Licenses," was submitted by MLA and attempted to make Chapter 444 more exacting in several ways. There was provision for prohibiting the leasing of licenses, and for making it admissible as evidence in court that money had
been paid to induce a permit holder into transferring his license. In the event that a commercial lobster license was suspended or revoked, no other type of commercial fishing license could be issued as a replacement.

Of the 80 new permits per year to be issued after 1981, 50 would go to applicants from the qualified portion of the list and 30 would go to applicants from the unqualified portion of the list. The criteria for qualification in the inshore lobster fishery would be changed to 6 months as a full time lobsterman or 12 months as a commercial fisherman or a combination thereof, possession of a non-commercial permit for over one year, and a commitment to participate in the coastal lobster fishery.

Special additional licenses would also be given to applicants who had held a seasonal student permit for 4 consecutive years. Appeals of transfer or application decisions would go to MFAC rather than to the commissioner as called for in Chapter 444.

Finally, the transfer provision would be changed to call for the existence of a partnership to be two years before a license could be transferred. H-1196 was an unsuccessful attempt to close some of the loopholes in the new lobster license law, as well to make the law more equitable.

The second bill to amend Chapter 444 was H-1197, "An Act Further Regulating The Provisions for the Issuance of Commercial Lobster Licenses," This was another attempt to
make MFAC the arbiter of appeals for transfer and license application disputes. Chapter 444 stated that all appeals shall be addressed the the commissioner of the Department of Fisheries Wildlife and Natural Resources. Making MFAC the appeals body would have placed the Commission in the same predicament regarding special additional licenses, as it had been with hardship licenses under the moratorium.

Finally, H-2457, "An Act Relative to the Issuance of Commercial Lobster Licenses," was an attempt to delete the special additional provisions that pertained to documented personal medical incapacity, or other unforeseen circumstances or Acts of God.

In 1983, the only bill filed with the legislature to amend Chapter 444 was H-1158. This bill was a refile of H-1196 from 1982. In 1984, H-1196 was again refiled as H-369.

Two Senate bills were also filed in 1984. The first of these, S-1277, called for the addition of a new paragraph to Chapter 444 which would have compelled the DMF Director to issue a commercial lobster license to any resident of the Commonwealth who is a Vietnam Veteran. The second, S-1278, would have compelled the DMF Director to issue a commercial lobster permit to any person who had maintained continuous residence in the Commonwealth since July 14, 1975. Both of these bills were re-filed, as S-1201 and S-1202, respectively, in 1985. No legislation to amend Chapter 444 was filed in 1986.
In the fall of 1987, proposals to tighten the transfer and special additional provisions of Chapter 444 were given by DMF to CNRA. As of the end of 1987 the Division was still waiting for these proposals to be filed as a bill. In the meantime, the Director prepared to use his administrative authority to freeze the total number of commercial inshore lobster licenses at their 1987 level, effective January 1, 1988.
NOTES

1 Frank Grice, "Proposed Legislation for 1975" (Document to Committee on Natural Resources and Agriculture, 1975), p. 2.

2 Division of Marine Fisheries Staff, "Review of Lobster License Moratorium" (Document to Committee on Natural Resources and Agriculture, 1979), p. 1.

3 Representative Robert Gillette, interview held in Pembroke Massachusetts, March 26, 1987.

4 Robert Barlow, interview held in Marshfield Massachusetts, February 13, 1987.

5 June M. Morris, Committee on Natural Resources and Agriculture Public Hearing (Document on proposed legislation, June 5, 1979) p. 6.

6 Representative Roger Goyette, "Lobster Legislation" (Memo to Committee on Natural Resource and Agriculture members, July, 1979).

7 David Hoover, personal communication, April, 1987.

8 Division of Marine Fisheries Staff, "House Bill 2077" (Position document to Committee on Natural Resources and Agriculture, March, 1980).

9 Ibid.
CHAPTER IV

THE POLITICAL HISTORY OF THE INSHORE LOBSTER FISHERY
LIMITED ENTRY PLAN

Introduction

This chapter places flesh on the bones described in chapter III by providing motivation for the legislative actions that were taken, and by recounting the evolution leading to each action in terms of the major players involved and concurrent events. As such, chapter IV is the heart of this thesis for buried within the following description are the reasons why this limited entry program has or has not lived up to the expectations placed upon it by management and industry. In addition, buried within this discourse lie many public policy lessons for planners of fisheries policy.

The information in this chapter comes from three sources: 1) published federal and state documents 2) unpublished reports and documents from the Division of Marine Fisheries, the Marine Fisheries Advisory Commission, the Massachusetts Lobstermen’s Association and the Massachusetts Legislature 3) interviews with legislators, policy makers and commercial lobster fishery representatives who played a key role in the design, implementation and administration of the limited entry law.
Before 1975

Events leading to limited entry

Several events took place in the 14 years preceding 1975 that have bearing on the implementation of the lobster license moratorium. The Marine Fisheries Advisory Commission (MFAC) was formed by the Governor in 1960 to serve as an advisory board to the Division of Marine Fisheries in the formation of marine fisheries policy, and to implement regulations and emergency actions. The MFAC consisted of citizens who were knowledgeable of the Commonwealth’s marine fisheries. In 1969, the power of MFAC to decide regulations and to override special acts of the Governor was established by the then Attorney General. This gave MFAC substantial power in the implementation of marine fisheries regulations and the design of fisheries policy. In practice, the Division of Marine Fisheries has since served as advisor to the Commission, whose decisions are final in the implementation of marine fisheries regulations. Most of Massachusetts marine fisheries policy has been designed and implemented since formation of the MFAC.¹

During the 1960’s, there were three lobstermen’s associations in Massachusetts. The South Shore Lobstermen’s Association, the Massachusetts Lobstermen’s Association and the Cape Ann Lobstermen’s Association. Of these three organizations, only one, the South Shore Lobstermen’s Association, enjoyed cordial relations with
the Division of Marine Fisheries. In addition, the Division considered the South Shore Lobstermen's Association to be the most progressive of the three.²

In the late 1960's, the Cape Ann Lobstermen's Association folded and the Massachusetts Lobstermen's Association was "infiltrated" by members of the South Shore Lobstermen's Association. This action provided stimulus for two events. First, the Massachusetts Lobstermen's Association (MLA) became a coast-wide organization with a majority of the Commonwealth's lobstermen as members. This meant that Massachusetts now had a lobstermen's organization that truly represented the majority view of Massachusetts lobstermen. Second, MLA became much more friendly to DMF and DMF representatives regularly began to attend MLA meetings. A close working relationship then evolved between the two organizations, which exists to this day.³

In 1968, a new DMF director, Frank Grice, was appointed. Mr. Grice supported limited entry as a method of marine fisheries management. His support for limited entry was instrumental in the promulgation of the 1975 lobster license moratorium.⁴

During the late 60's and early 70's there was a steady rise in the amount of gear being used in the inshore commercial lobster fishery. In addition, long-time lobstermen who had traditionally done well enough to take time off in the winter could no longer do so. Many were
forced to commence fishing year-round. Full time lobster fishermen perceived that this increase in gear was coming from an influx of new fishermen, and a large, and growing number of part time lobster fishermen. The so-called full time lobster fishermen believed that the industry's main problem was the "part-timers." ⁵

In late 1969, MLA attempted to reduce entry into the lobster fishery by introducing legislation to increase commercial inshore lobster license fees from 10 to 100 dollars. In the meantime, DMF worked with a special legislative commission to look at the entire marine fisheries licensing issue. One result of these efforts was that the commercial inshore lobster license became the highest priced marine fisheries license in the marine fisheries when the marine fisheries licensing bill was passed in 1970. ⁶

The next step taken by MLA in the early 70's was to attempt to restrict non-commercial lobstering by prohibiting non-commercial fishing during the weekend. DMF strongly opposed this action because of its policy that public right of access to the resource must be maintained. The agency also attempted to get the commercial lobstermen off the tack of complaining about family lobstermen. ⁷

All of these efforts were symptomatic of the larger overall problem of increasing effort in the commercial inshore lobster industry. Division lobster biologists believed that part time and recreational lobstermen were
not the primary problem, but rather that the tremendous number of people fishing commercially, both full and part time, was placing too much effort on the resource. In addition, the number of traps being used was increasing at an alarming rate. Both MLA and DMF realized that something soon would have to be done to curb effort in the inshore lobster fishery. DMF felt that something specifically had to be done to reduce commercial effort. 8

The belief by Division administrators that effort controls were necessary was intensified by reports from the lobster committee for the Atlantic States Marine Fisheries Commission which was then attempting to develop a state federal lobster management plan. The committee declared that the lobster resource was one of the most highly exploited of all marine resources in the northeast, and detailed the need to increase the minimum size of lobsters to 3 1/2 inches on a regional basis. They also felt that poor fishing practices, such as V-notching and mutilation, had to be stopped. The committee concluded that a real potential existed for a collapse of the lobster fishery. 9

The Division agreed with this overall assessment for they believed that lobsters were being fished at a knife edge in that most lobsters were caught as soon as they reached the legal minimum size. Indeed, some biologists felt that the only reason the resource had not yet collapsed was because of the minimum size law combined with a new regulation mandating the installation of escape vents.
in all lobster traps and protection of egg bearing females.\textsuperscript{10}

However, this agreement on the nature of the problem did not lead to immediate agreement on how to address improving the condition of the Massachusetts lobster resource. After some debate within the Division and the MFAC, it was decided that the best way to approach the problem was through a trap limitation program similar to the trap tagging system then being implemented in the Canadian Maritime Provinces.\textsuperscript{11}

MLA agreed with the need for gear reductions, but expressed strong concern about newcomers to the lobster fishery taking up the slack created by fishermen reducing their effort. As a result, MLA decided to go along with trap limitations only if the state reciprocated by limiting the number of fishermen in the industry, specifically, through a license limitation program. DMF agreed that license limitation was appropriate to mitigate entry along with reducing the number of traps. They proposed that a joint DMF, MLA committee be formed to address the issue of limiting entry into the fishery and then reducing the amount of gear that could be fished. The formation of this committee in 1974 was the start of the real thrust to get limited entry legislation for the inshore commercial lobster fishery.\textsuperscript{12}

Note that, already, the emphasis had shifted from reducing effort first and then limiting entry, to limiting
entry first and then considering effort limitations. Part of the reason for this was a lack of agreement among lobstersmen about how to equitably reduce the number of traps fished on a state-wide basis. The problem was simple to define. Massachusetts' 1500 mile coast is divided into five inshore lobstering regions: Cape Ann, Boston Harbor, Cape Cod Bay, the lower Cape and Buzzards Bay. Each of these regions is distinct from the others in terms of the method employed in lobstering, and the number of traps used. This difference in the number of traps used regionally, coupled with concerns by industry and management about the enforceability of trap limitations precluded consensus on how to go about reducing the overall number of traps.

These issues left the Massachusetts Legislature with an interesting problem when they began to consider ways to protect the lobster resource. On the one hand, they were receiving considerable pressure from MLA to reduce effort by limiting the number of fishermen. On the other hand, DMF had legitimate concerns to protect the lobster fishery and the resource itself. It was also clear that to do nothing was a mistake. A minimum legal size increase was not a viable option without interstate cooperation (something that would not be forthcoming), landing taxes were out of the question, and there was no way to gain consensus by the lobster fishermen on how to go about limiting gear. As a result, license limitations became the
only politically viable option open to the legislature in early 1975. They concluded that it was easier to limit licenses than to limit gear, and more politically feasible to limit licenses than to increase the minimum size.\textsuperscript{13}

\textbf{1975}

A new licensing system

Although the proposal to placing a moratorium on licenses was agreed to by both industry and DMF, at least until a better system could be devised, the actual lobster moratorium bill "evolved as a compromise between a perennial bill filed by MLA seeking to limit the number of permits to 1,000, and a bill filed by DMF to increase the Director's power to include authority to limit effort in a fishery."\textsuperscript{14}

As a result, the license moratorium bill designed by the Committee on Natural Resources and Agriculture (CNRA), and was filed by them as H-5677, with joint industry and management support. Once the bill was in the legislature, the process under which it was passed was extraordinary. Never, before or since, had state fisheries managers seen a bill go through the legislature so fast. There are three likely reasons for this. First, as mentioned above, the least offensive of the available options to improve management of the lobster resource was some form of license limitation system. Second, partly because of this and partly due to the lobbying efforts of MLA, coastal legislators united in support of the bill. Third, the
House of Representatives majority whip, Robert (Biff) MacLain, of New Bedford, had a powerful influence on the legislature. This meant that once the bill gained his support, the non-coastal legislators readily went along.\textsuperscript{15}

The Legislature also perceived that something had to be done to protect the lobster resource despite the likelihood that this particular action would not achieve that goal. As is evidenced by the phrase, "endangered food species", in the preamble to Chapter 484, the legislature thought that the American lobster, Homarus americanus, was an endangered species. Therefore, H-5677 was passed primarily because the legislature believed they had to start somewhere. However, it was hoped that the continued economic plight of the commercial inshore lobster fishermen would make them realize that they must eventually make some compromises to arrive at a trap limit.\textsuperscript{16}

Additions to H-5677

Even with the limited benefits forecast by the legislature with passage of this bill, three major additions were made to it. The first of these was the inclusion of a study into the design of a more permanent limited entry system, complete with trap limits, to be undertaken over the first year after passage. This provision was added partly because of information provided in a booklet by Francis X. Cameron of the University of Rhode Island Marine Affairs Program entitled \textit{Constitutional Impediments to Limited Entry Fisheries Legislation}.  
Legislation. Cameron indicated that arbitrary passage of a license moratorium without a study of more permanent ways of managing entry would be unconstitutional. The study was therefore added primarily to protect the law from court challenges. Including the phrase "endangered food species" in the preamble of Chapter 484 may also have served this purpose.17

The second major addition to the legislation was the hardship and transfer provisions, which were designed to allow some entry under the moratorium. The hardship provision allowed people who could prove dependency on the lobster fishery as their only source of income to obtain licenses. This provision added 130, or 10%, additional licenses to the cap of 1300 per year and placed responsibility for approval of these licenses on MFAC. In addition, if the Director decided to turn down a hardship license application, appeals could be made to MFAC whose decision would be final. No set of criteria for making judgements on hardship applications was included in the legislation. The transfer provision allowed transfers among individuals, partnerships or corporations if the DMF Director deemed such transfers in the public interest. As we shall see, these provisions caused fits at both DMF and MFAC, and became the single most contentious, time consuming, arbitrary and laborious aspect of this piece of legislation.18

The third addition to the bill was the number of
licenses to be issued every year. While it was clear that some cap must be achieved with the license moratorium, the actual cap of 1300 licenses per year was derived as a matter of political expediency. No legislator at that time, regardless of where he was from, was going to take licenses away from existing fishermen, which is what MLA wanted them to do. As a result, the 1300 license maximum was formulated by taking the 35-45 applications that were being received each year and adding that number to the total number of licenses issued in 1974. Since that number was just under 1300, the cap was rounded off to 1300 licenses per year.19

With these provisions incorporated into the bill, H-5677 was by both the House and Senate in July 1975, and enacted by the Governor as Chapter 484 of the Acts of 1975. A request for position on enacted legislation was sent to DMF Director Grice by the Governor's Legislative Office in early July, and some of his comments provide insight as to the DMF view of this legislation. In providing a summary of the bill, Grice stated that "the general purpose of the bill is to begin to regulate the rapidly expanding coastal lobster fishery so as to protect the lobster resource and reduce the excessive number of traps now being employed to harvest this limited resource." When asked what the positive and negative effects of this bill would be, Grice replied: "This bill would start the process of limiting entry into this over-capitalized and over-exploited fishery
and therefore lead to better resource management. On the negative side, the bill could preclude new opportunities to those who might wish to fish commercially for lobsters in our coastal waters."}\(^{20}\)

The Director was then asked whether the bill should be enacted in its present form. To this he replied: "The bill should be enacted in its present form. Timing is critical in this instance since the Division has already issued close to the maximum number of permits listed in the bill." Finally, when asked how important this bill was relative to other bills the Division had filed that year, Grice replied: "This is the most important piece of legislation for this session."\(^{21}\)

It is clear from these comments, that the Division considered this bill a first step in improving management of the inshore lobster resource. The moratorium was to start the process of both limiting entry into the fishery and reducing the number of traps employed by the fishery. In fact, the Division felt so strongly of the need for effort controls that it did not believe a license limitation scheme could be maintained unless it led to trap limitations. DMF also believed that the moratorium would give MLA added incentive to work towards gear limitations.\(^{22}\)

Once H-5677 was implemented as Chapter 484, on July 14, 1975, a major problem immediately arose. The commercial lobster fishery raised a row because no grandfathering
provision had been incorporated into the law. As was discussed in Chapter 3, a new bill was submitted and passed by the legislature in late 1975 that added this provision plus the so-called "must fish" provision prior to the 1976 licensing season. (See Appendix A, Chapter 729)

1976 - 1979

The change in demand for licenses

During the last three days before the end of the license renewal period in 1976, over 200 licenses were passed out, on a first-come, first-served basis, to bring the total number of licenses issued to 1300. During the renewal period in 1977, 201 licenses were issued in two days, primarily because of inclement weather. In 1978, there was chaos at the Saltonstall Building with the license line forming the night before they were to be passed out, and crowds being kept by the police in the second floor lobby while small groups at a time were allowed up to the 19th floor DMF offices. Over 400 people appeared for the 154 licenses available that year. In 1979, DMF was forced to go to a lottery system and received 1041 applications for 48 available licenses. As each year went by, more and more people wanted licenses while fewer licenses became available. The demand for lobster licenses was clearly increasing, and fishermen were ceasing to retire their licenses.23

In addition to increasing numbers of people interested
in obtaining licenses, DMF officials noticed that the character of people changed each year. In the first year, most of the available licenses went to fishermen (from other fisheries) who straggled in to renew their licenses and picked up a lobster license when they were informed of their availability. These people then passed the word on to their associates, and so the available licenses went. By 1977, the word was out, and three piece suits mixed in with the fishermen waiting in line indicated that speculators were also interested in lobster licenses.24

By 1978, it was clear that the licenses were accruing value as evidenced by drastic increase in demand and very few licenses being retired. The reason for this value being placed on licenses was because licenses could be transferred, although subject to the approval of the Director. It was believed that some license holders were selling $5000 boats and gear for as much as $15000 with license. Neither this increase in demand for licenses, nor the subsequent accrual of value to licenses through the transfer loophole was anticipated by MLA or by the DMF staff.25

The Chapter 484 hardship provision

A second problem with the lobster license moratorium was the matter of adjudicating hardship applications. Chapter 484 was interpreted in a very literal sense during the last year and a half of Frank Grice's tenure as DMF Director. As a result, during 1975 and 1976, hardship
applications were dealt with by MFAC on a case by case basis. At that time, each applicant's name was known by MFAC members, and with no criteria to follow, the proceedings became very subjective. For example, the Advisory Commission had to decide who should and who should not be considered a hardship case, and learn to decide when people were telling the truth and when they were lying, all on a case by case basis.26

In addition, the hardship process began to demand an increasing amount of MFAC business meeting time because individual hardship applications often took over an hour to decide. DMF estimated that over 80% of the Commission's time in 1976 and 1977 was spent deciding upon hardship applications.27

Not long after Allen Peterson became the new DMF Director in July of 1976, he told the MFAC to design a set of criteria against which hardship applications could be judged. This was done because the hardship system was becoming a nightmare for everyone involved. Not only were huge amounts of MFAC and Division staff time being taken up by hardship applications, but both DMF and MFAC were facing increasing allegations that the distribution of hardship licenses was a political process. The hardship aspect of the lobster license moratorium thus became politically controversial. Indeed, members of the legislature place great pressure on the Division to get hardship licenses for constituents who were ineligible to get a license.28
In addition to this, when new hardship criteria were implemented, it became apparent that there were always extenuating circumstances. MFAC reacted to this by attempting to add methods to address extenuating circumstances into the hardship criteria. As a result, the hardship criteria evolved over time.²⁹

Another concern of Peterson's was that of conflict of interest by MFAC members in deciding hardship applications. First, he became anxious about Commission members knowing the names of applicants prior to deciding on whether or not they should receive hardship licenses. This resulted in the names of applicants being deleted from applications so that circumstances rather than personalities dictated the distribution of licenses. Second, the Director felt that conflict of interest may exist when MFAC members who were in the lobster industry voted on hardship applications. As a result, the two lobster industry representatives on the Commission were told not to vote on hardship applications.³⁰

In the meantime, Director Peterson became frustrated with the amount of time the Commission was spending on hardship applications and appeals. Peterson realized that the inordinate amount of time being spent on hardships was undermining the purpose of the Commission and would eventually destroy that body. He therefore attempted to expedite the process by establishing categories of hardships and having the Commission approve them in blocks.
The Director would then come to Commission meetings with his hardship recommendations, and the Commission would essentially rubber stamp the Director's recommendations. As a result, the Director took a much stronger role in the hardship decision process thus freeing the Commission to perform its other functions. The Commission thereafter only became involved in the initial decision process when there were hardship applications that the Director could not decide upon. This process did succeed in reducing the work load at MFAC meetings leaving more time for matters other than lobster license hardship applications and appeals.31

In pursuit of the elusive effort controls

According to one legislator, the study to develop a more permanent system for the issuance of permits and the development of a gear limitation program was added to Chapter 484 for three reasons. First, to determine the overall effect of the 1300 license limit on the commercial inshore lobster fishery. Second, to determine the degree of continued support for the moratorium. Third, as mentioned earlier, to address the U.S. Supreme Court edict that license moratoriums are constitutional so long as a concurrent study is taking place to figure out ways of preserving an endangered fishery.32

In any case, MLA and DMF took the study seriously for both organizations had agreed, in late 1975 and early 1976, that a permanent limited entry system with gear limitations
was essential for the continued vitality of the inshore lobster fishery; that the moratorium, taken alone, was inadequate to conserve the resource.\textsuperscript{33}

In the summer of 1976, questionnaires were distributed to coastal lobstermen, and a series of public meetings were held to hammer out a limited entry program with a trap limitation scheme. During this period, MLA and DMF were able to generate a great deal of support for the overall concept of trap limitations for full-time commercial lobstermen. The idea was if all concerned could settle on a reasonable trap limit initially, say 400 traps, then each fisherman's total number of traps could be reduced by 10\% per year to the point where there were enough traps for the perceived size of the resource.\textsuperscript{34}

One issue that came up during these meetings was the matter of part-time fishermen. Full-time lobstermen believed that effort could be reduced also by limiting the number of part-timers. They proposed that the total number of part-timers be reduced to 50, and then reduce them further by a percentage each year, much in the same way as traps were to be reduced.

DMF responded negatively to this proposal for two reasons. First, they believed that elimination of part-time fishermen from the inshore commercial fishery was not sociologically or politically justifiable. Second, reducing or eliminating part-timers raised the specter of defining part-time versus full-time lobster fishermen. It
should be noted that DMF considered the commercial inshore lobster fishery a part-time fishery because such a large percentage of commercial lobstermen had some additional source of income. 35

The two major sticking points of the trap reduction scheme were how to equitably conduct the reduction of traps on a regional basis, and how to enforce a trap limitation. The former problem was a major bone of contention to the Boston lobster fishery because they were already fishing 400-600 traps, far more than in any other region, and therefore stood to lose the most with the scheme. As a result, although agreement was reached on the process of reducing traps by most coastal lobstermen, there was no way that anyone was able to get the Boston fishermen to agree. This group was adamant about realizing their own needs despite the pressure applied to them by other coastal fishermen. The Boston fishery could not justify immediate initial reductions from 600 to 400 traps. 36

This problem was addressed by a proposal to initially limit the number of traps statewide to 400, or the average number of traps a lobsterman had fished in the last three years. Therefore, if one could prove that he had fished an average of over 400 traps in the preceding three years, he could then start at this average and reduce the number by a percentage each year. Many Boston lobstermen felt that this might work. 37

The latter problem was how to enforce a trap limit. In
was achieved. Trap tags would be required for all traps, and a closed season would be imposed for all but class A permit holders. Agency hearings would be used to determine violations of lobster laws, and suspension or revocation of fishing privileges would be used for punishment.  

DMF hoped that this proposal would serve as basis for discussion at the public meetings and that a variation on its theme would be incorporated into their report to the Legislature which was due in December, 1976. DMF conceded that if agreement on the type of system to be used could not be reached, the December report would not recommend any drastic changes to the law. Unfortunately, the latter case is what occurred, so the December report to the Legislature indeed recommended a continuation of the present system. 

This is where the issue of effort controls was left when Frank Grice left the Division in late 1976. In fact, this is where the issue of effort controls was left until 1979, when revisions to the lobster moratorium were first considered. The lack of further attempts to implement effort restrictions between 1976 and 1979 appears to have occurred for two reasons: time constraints placed on DMF and MFAC because of the hardship process, and philosophical changes in the Division. In the former case, so much time and emphasis was demanded of MFAC and DMF in determining hardship application and appeals cases, that it was the only aspect of the moratorium either organization had the resources to deal with. In particular, the hardship
provision of Chapter 484 was forced into priority status over other provisions because of the sheer numbers of hardship cases. Other provisions of the law were relegated to secondary status, at least, until Director Peterson commenced the block method of determining hardship applications in 1978.\textsuperscript{42}

The philosophical change occurred with the Division when Frank Grice was replaced as DMF Director by his Assistant Director for Recreational Fisheries, Allan Peterson. Allan Peterson was philosophically opposed to limited entry on the basis of the inequities such systems created for the user groups involved. However, despite his own misgivings about limited entry, Mr. Peterson did his best to implement the moratorium, and always felt that the problems with the law were more in implementing it rather than problems with limited entry itself. Although it can be argued that the hardship situation precluded serious further consideration of effort limitations, there are those who believe they would have been pursued had Peterson been of a different philosophical bent. In any case, effort limitations were not pursued during Allen Peterson's tenure as DMF Director.\textsuperscript{43}

With no constraints on effort, the number of traps being used in the lobster fishery continued to grow during the late 1970's. That is, those who were left in the fishery increased their effort by increasing the amount of gear they were fishing. In addition, because of the
hardship provision, this was not a true moratorium on the issuance of licenses. The rate of increase of licenses had been reduced, but the number of fishermen, and additional gear associated with those fishermen, continued to mount.\textsuperscript{44}

There was also another reason for this gear increase. Chapter 729 gave the DMF Director power to give priority in issuing licenses to applicants who had held permits and fished during the preceding year. This meant that the grandfather clause was qualified by a potential fishing requirement (subject to the Directors discretion). As a result, the perception grew among fishermen that a certain number of pounds of lobster had to be caught to retain a commercial inshore lobster permit. This resulted in actual increases in effort and false catch reporting, where people exaggerated their effort.\textsuperscript{45}

Matters were made even worse when the Division began to audit catch reports in 1977 to improve the overall accuracy of statistical information on the lobster fishery. Many fishermen, incorrectly interpreting the meaning of the term "audit", thought that the catch report audits had something to do with the U.S. Internal Revenue Service. This resulted in many of the more successful fishermen under-reporting their catch in order to minimize their tax burden. The so-called "must fish" provision and the catch report audits thus compounded the unreliability of the catch report system because marginal fishermen over-reported their catch in order to retain their commercial
licenses, and successful fishermen under-reported their catch for fear of the IRS. 46

Simultaneous issues

In 1976, the Magnuson Fishery Conservation and Management Act was passed by the Federal Government, and a new 200 mile limit law thus was implemented. Besides reducing the number of foreign ships fishing off U.S. shores, the Act caused a tremendous resurgence in interest in fishing by U.S. citizens. People became interested in fishing because of the increased availability of federal capital for building boats and outfitting fishing operations. They also realized that competition for offshore fisheries resources had been substantially reduced. This favorable environment prompted people to obtain commercial licenses, and the most accessible means of fishing was lobstering since it was a coastal fishery that required less capital and less past experience than the offshore fisheries. This situation caused a second increase in demand for lobster licenses, the first having been created by the license transfer provision, thus placing a great deal of added pressure on the system. Newcomers could only get licenses through the hardship process, and only a small number of hardship licenses were distributed by MFAC each year. 47

This resulted in an increase in the number of complaints being received by the State. People who were unable to get permits were very unhappy with the moratorium
and voiced their complaints in no uncertain terms, with many would be lobstermen stating that the system was inherently unfair and, perhaps, even fixed. By early 1979, the State was receiving complaints also by existing commercial lobstermen who were concerned that they would not be able to transfer their licenses to their children. Other fishermen, who had traditionally fished in several fisheries but who had let their lobster licenses lapse, also complained about the system's lack of fairness. In addition, the moratorium was only supposed to have been in place for a year or two while a more permanent licensing system was designed. Many people began asking why the moratorium continued in 1979 when it was supposed to have been replaced by 1977.48

The system was also stressed by enforcement problems. It seems that people unable to get inshore licenses were issued offshore lobster licenses (which were not limited) and fished inside. Also, during the life of the moratorium (1975-1980) the number of inshore commercial permits increased by 3% while the number of recreational 10-pot permits increased by over 50%. Recreational licenses may therefore have been used by part time commercial fishermen who sold their catch illegally or fished more than 10 pots.49

The Legislature was very concerned about this public discontent, and was particularly concerned about the length of time the moratorium and study had been in place without
any proposals for a more permanent system. They felt that if the study and moratorium continued beyond five years, the likelihood of successful challenges to the constitutionality of the law would increase dramatically. In fact, a constitutional challenge to the moratorium had already taken place in 1978 with the court ruling against the plaintiff. The legislative perception in early 1979 was that the inshore lobster fishery was in as bad shape as it had been in 1974, and that the time was ripe for a change. In addition, the subject of limited entry was a political hot potato because many members were adamantly opposed to any form of limited entry. These legislators felt that licenses should be issued to anyone who wanted to enter the fishery, and then the market place should determine success and failure. Coastal legislators therefore approached MLA telling them to do something about effort controls, and applied pressure to DMF to design a more permanent system.50

As a result of this growing unrest by both permit holders and non permit holders, combined with administrative problems with the hardship provision, and compounded by enforcement problems, legislative pressure on DMF to change the system intensified in late 1978 and early 1979. As a result, one of the most pressing items on the agenda was to overhaul the inshore commercial lobster licensing system when Phil Coates became DMF Director in July of that year.51
1979 - 1980

The need for new legislation

A document written by the DMF staff to the Committee on Natural Resources and Agriculture in March, 1979, entitled "Review of the Lobster License Moratorium" summarized the Division experience and assessment of the lobster license moratorium. The document commenced with a statement that the moratorium had largely failed to accomplish its primary goals to "establish an equitable system which provided economic relief while further protecting and enhancing the resource.", and went on to say "Despite concerted efforts by Division personnel, organized lobstermen, and members of the legislature a more comprehensive system has not been developed, and the moratorium has persisted for nearly four years."52

From an administrative standpoint, the report concluded that the Act was "unwieldy and time-consuming," that the "requirement that the individual applying for renewal must have 'fished' has further complicated the process" because of the increased tendency to falsify catch reports, and that there was a substantial increase in demand for lobster licenses. The document went on to relate how the lack of criteria in the legislation for either the transfer provision, or the hardship provision further confounded the process.53

From an economic standpoint, the Division concluded that the moratorium had "failed largely because it limits
only the number of fishermen, not actual effort in the fishery, and ignores the factors which determine the level of exploitation, including stock abundance, ex-vessel prices, and harvesting costs." The economic assessment went on to say that effort in the fishery had continued to increase despite the moratorium. To illustrate this, the average number of pots fished in the four years preceding the moratorium (1970-1974) was compared with the average number of pots fished in the four years after the moratorium (1975-1978). It was determined from this that the number of pots fished had increased 46%, and the reported catch had increased 52%. The report added that the main economic impact of the moratorium had been to "change the pattern of income distribution, without increasing the amount of benefits from the fishery."54

The report concluded that it was difficult to determine whether increases in effort in the fishery had been slowed, as was the original intent of the moratorium, or if the large numbers of people who were not allowed licenses (4-500 individuals in 1979) would not have been interested in a lobster license in the first place had there been no moratorium. In this regard, the report stated "it must be recognized that the phenomena of limited entry itself has artificially increased the desire of people to enter the fishery. If there were no limited entry, it is probable that there would not be such an intense intent in obtaining a license."55
The report stated that, although the moratorium had not fulfilled any of the original goals anticipated by both the Division and industry, it was clear that complete elimination of limited entry would cause severe economic disruption. For this reason, the Division concluded with: "We emphasize that the current moratorium and any legislation that would perpetuate a more restrictive moratorium must be rigorously examined by all concerned parties and that a more equitable system must be developed as rapidly as possible." It is therefore evident that the Division also realized, in early 1979, that the time had come for new legislation, and this summary document was used as the foundation upon which the new legislation would rest.56

House 3345

The document "Review of Lobster License Moratorium" was written to the Committee on Natural Resources and Agriculture (CNRA) in response to House bill 3345, An Act Providing for a More Limited Distribution of Commercial Lobster Permits which was prepared and submitted by MLA. In the cover letter to the document, Allen Peterson stated that "We are greatly concerned about . . . this proposed legislation since, in our opinion, it perpetuates a licensing scheme that has clearly fallen short of hoped-for goals to achieve stability in the lobster industry, and affords some control of effort in the fishery."57

On the other hand, H-3345 was considered the most
important piece of pending legislation on the lobster licensing issue by MLA. MLA felt strongly that economic stabilization in the lobster fishery should be accompanied by reduction of pressure on the lobster stocks. However, they were concerned about the Canadian realization that a mistake had been made, in the Maritime Provinces lobster limited entry program, by first limiting effort through gear restrictions and then limiting entry. The Canadian advice was to stabilize entry first, and then seek measures to reduce effort. H-3345 was designed to do this by reducing the number of licenses renewed by a percentage each year until a goal of 1000 licenses was achieved.\(^{58}\)

In a document supporting H-3345 for CNRA hearings scheduled for March 20th, MLA itself advised that entry into the lobster fishery be further restricted, that the moratorium not be lifted as this would result in a "horrendous situation", and that this legislation could serve as an interim conservation measure until an increase in the minimum legal size of female lobsters was achieved on a regional basis. MLA concluded their statement with the suggestion that trap limits be discussed within the framework of H-3345. Unfortunately for MLA, CNRA took the Division's advice and tabled H-3345 after its hearings on March 20.\(^{59}\)

H-6352, The two-tier licensing system

The first action the Division took in 1979 to replace the moratorium was to dust off Frank Grice's two-tier
licensing system which had been developed in 1975-1976. This system was then brought up to date by using other systems, such as Alaska's. The Division viewpoint, as expressed to the Commissioner of the Department of Fisheries, Wildlife and Recreational Vehicles in early April, was that: "if we must have limited entry, the two class or two tiered system still looks like the most equitable way to provide access to the lobster fishery for part-timers and still provide restricted entry and thus protection for fishermen with a substantial commitment to the lobster fishery."60

The two-tier system was then brought to public meetings where it was severely criticized by part-time lobstermen who felt discriminated against by the legislation. In addition, seasonal full time fishermen objected because classification as a class B fisherman forced them to fish a limited number of traps regardless of their past catch. These fishermen were very concerned because they fished intensely, and no matter how one cut the legislation, they would no longer be able to fish intensely.61

Nevertheless, H-6352 was filed by Representative MacLain, in May, despite his own misgivings about the potential effects a two-tiered system would have on the lobster industry. MacLain filed the bill to help the Division in its efforts to replace the moratorium, and to induce action on the moratorium by the legislature and MLA. This latter case is an illustration of legislators filing
legislation to make a point or to induce action.\textsuperscript{62}

It was because of this action that a falling out occurred between Biff MacLain and the Executive Director of MLA, Bob Barlow. Apparently, Barlow and MacLain discussed the two-tier system and Barlow deferred judgement on this approach until he could obtain a vote from the MLA delegates. However, MacLain was left with the impression that Barlow supported the two-tier approach and that MLA would also proffer its support, and was livid when Barlow returned with a negative vote from the MLA delegates. MacLain felt that Barlow had double-crossed him. The initial result of this was that the legislature gave MLA an ultimatum that either the lobstermen accept the two-tier system, or they would repeal the moratorium. According to some observers, the latter result of this was that Bob Barlow lost his seat on MFAC for three years.\textsuperscript{63}

In the meantime, in late May, one of the most significant changes in direction of this whole process took place at a public meeting on the two-tier system in Plymouth. During heated debate on the two-tier system, a lobsterman suggested replacing the entire limited entry system with a yearly increase in the number of licenses issued based on the perceived rate of lobster license attrition. In this way, current lobstermen would be protected from being classified part-time versus full-time, and those interested in obtaining licenses would be placed on a list by lottery. MLA looked at this as a continuation
of limited entry since the number of new entrants would base itself on the attrition rate. On the other hand, DMF saw this as a phase-out of the moratorium, and estimated that the lobster fishery would eventually return to free entry.\textsuperscript{64}

The problem with the new phase-out approach was that H-6352 had already been filed for DMF by Biff MacLain. Now DMF had turned against the two-tier system. At the CNRA public hearing on H-6352, Biff MacLain spoke in favor of the two-tier system, while both DMF and MLA spoke against it. MacLain now felt deceived by both DMF and MLA. In fact, DMF submitted a redraft of H-6352 to CNRA prior to this hearing calling for a phase-out of the present moratorium. This hearing resulted in H-6426 which ordered that H-6352 go into a study, thus killing the two-tier proposal. Also, recommendations for new legislation were made, allowing for the development of a moratorium phase-out.\textsuperscript{65}

The remainder of 1979 was spent by CNRA, MLA and DMF, developing the new phase-out approach. Great emphasis was placed on the development of new legislation because of the continued perception, by industry and the Division, that lack of appropriate substitute legislation would result in the moratorium simply being repealed. DMF therefore strongly supported H-6426, which became the initial draft of the phase-out legislation.

However, this does not mean that development of the
phase-out approach lacked controversy. For example, in August MLA wrote the Chairman of CNRA expressing extreme concern for a paragraph that had been added to the legislation, which would allow permits to be transferred between any individual, partnership, or corporation. In MLA's view, this provision would destroy the intent of the phase-out because no permits would be retired, value would be added to permits, speculation would be encouraged, and large corporations could conceivably buy up permits. CNRA allayed MLA's concerns and deleted the paragraph from the legislation, albeit temporarily.\textsuperscript{66}

Also, in November, the new DMF Director, Phil Coates, wrote the Division legal counsel asking him to draft new legislation based on a compromise, acceptable to all parties concerned, that had just been hammered out. This compromise was submitted as H-5211 in 1980. In the meantime, the moratorium continued for the 1980 license renewal period.\textsuperscript{67}

Chapter 444 of the Acts of 1980

1980 commenced with CNRA hearings relative to H-2077, which was the compromise phase-out bill, mentioned above, that was late-filed with the legislature by DMF in November, 1979. This bill called for the issuance of 150 new licenses in 1980 and restricted license transfer to members of immediate families, subject to the approval of the Director. In February, 1980, the Division gave H-2077 an adverse report because it was already working on a new
draft of the phase-out legislation; H-5211.

H-5211 was filed with the legislature by Biff MacLain in January, 1979, and went before public hearing with CNRA in April, 1980. H-5211 called for the issuance of 130 new permits in 1980, and 100 new permits in every year thereafter. This legislation would allow permits to be transferred, subject to the approval of the Director, between members of the immediate family, and between members of partnerships or corporations when such partnerships or corporations were dissolved.

H-5211 was supported by MLA, which, at this time expressed the belief that the bill had a greater chance of passage if it contained a hardship provision. CNRA reviewed both H-5211 and H-2077 together and, as near as can be determined from the draft bills of H-5211 and H-5211/2077, the final version of the transfer provision was added in late April. In addition, the number of new licenses to be allowed was reduced to 100 during 1980, and 80 thereafter. Also, a hardship provision was added to the bill in late April that allowed the Director to issue up to 30 additional permits in 1980, and 20 additional permits thereafter to so-called "special additional" applicants. This final draft of the phase-out legislation was filed as H-6544 in late May, 1980. Shortly thereafter, it was passed by the Legislature, and on July 10, 1980, was signed into law as Chapter 444 of the Acts of 1980.

The reason time was spent in reviewing the evolution of
the transfer and hardship provisions of Chapter 444 is that these two provisions, especially the transfer provision, have since caused the greatest controversy with the law. All of the people interviewed, in industry, the legislature and DMF, related the surprise and consternation expressed by DMF and MLA that the transfer provision had been added at the last minute, presumably by a disgruntled legislator, without the prior knowledge of either organization. However, the record shows that the transfer provision, in its final form, was on drafts of the bill a month before it was filed with the legislature.

It appears that either DMF and MLA did not review the bill in late April, which is highly unlikely since the draft copies of the legislation reviewed by the author were DMF copies, or the ramifications of the transfer provision simply were not anticipated. It is likely that the latter case is true, and this is supported by an analysis of Chapter 444, written by the DMF General Counsel, David Hoover, on July 31. In this document, Hoover merely describes the transfer provision. No comments are offered on its possible effects on the limited entry law. In any case, the transfer provision, first, and later the special additional provision caused a great deal of difficulty in administering the new limited entry law.69
1980 - 1987

The first year

The original phase-out bill, as envisioned by DMF, was a bare bones increase in the numbers of licenses each year, it was hoped, with an equivalent reduction in the number of licenses through attrition. There was provision only for transfers among family members, or upon termination of a partnership or corporation. What emerged from the legislature in July, 1980 was quite different. First, there was a provision for hardship cases, the so-called "special additional" clause, second, rather than carrying over the transfer provision of the moratorium, a formal transfer process was included and third, a provision was added to address experienced versus inexperienced lobstermen for the list licenses issued each year.

At the time of the bill's signing, DMF had just finished issuing the last group of licenses under the moratorium. Now they had a new law to work with, and therefore met to set up applications for experienced and inexperienced license applicants. Since applicants placement on the list was to be determined by lottery, a drawing was held in the large second floor lobby of the Saltonstall State Office building. At this drawing, a list of approximately 500 experienced applicants followed by 600 inexperienced applicants was drawn up. The list was then, as required by law, time stamped, registered and published by the Secretary of Commerce, and distributed to all
coastal communities, harbor masters and town governments. This process made the list public, and therefore immune to tampering. 71

The role of the Advisory Commission was also changed by the law, for now they were only required to devise criteria on issuance of special additional licenses; what came to be termed "super hardships" by MFAC and DMF. Decisions on hardship cases were left to the DMF Director. 72

DMF then went about the business of administering the law, planning to issue 100 licenses off the list and 30 special additionals during the first year (Section 2 of Chapter 444 took effect on December 1, 1980), and issuing 80 list licenses and 20 special additional licenses for each year thereafter. However, a language interpretation problem with this provision induced the need for an immediate change. The Chapter 444 special additional provision read: "The director may issue up to 30 permits in 1981, and 20 additional permits for each year thereafter." Literal translation of the word "additional" dictated that from 1982 on, 50 special additional licenses be issued; 30 plus 20. This was not the intent of the law, so corrective legislation deleting the word "additional" from the special additional provision was passed as Chapter 769, of the Acts of 1981.

Another problem was with the provision stating that appeals for special additional decisions made by the Director could be taken to the Commissioner of the
Department of Fish, Wildlife and Environmental Law Enforcement. This raised Division concern, that the Commissioner would use the hardship appeals process as an avenue to gain political favor, thus destroying the system through political wheeling and dealing. Phil Coates responded to this situation by approaching then Commissioner Steven Chmura, 120 hardship applications in hand for the 30 available in 1981, and telling him that DMF and MFAC were going to circumvent the appeals provision by reviewing hardship applications and issuing licenses all in one day. As a result, no one would be able to appeal. On the other hand, if only a few of the thirty available hardship licenses were issued, Chmura would receive an avalanche of hardship appeals. Chmura weighed the potential benefits of the provision against the cons of having a series of heated appeals hearings and decided to go along with this process. The hardship process has been conducted in this way ever since.\textsuperscript{73}

The experience requirement

As mentioned earlier, DMF did not anticipate the addition of the experience provision. However, when confronted with it, DMF reacted by following through with its administration. It took 6 years for the 500 people on the experienced list to be offered licenses. 1987 was the first year that licenses were offered to applicants off the original inexperienced list, provided they had received the required experience prior to their name coming up.\textsuperscript{74}
On the other hand, MLA was furious with the addition of this provision because of the high potential for abuse. For example, all one needed to obtain experience were false affidavits. The MLA assessment of this provision was that it did nothing to improve the character of the fishery or reduce entry into the fishery, and therefore was a waste of time and money. MLA believed that the provision came about as a watering down of a proposal to provide an apprenticeship clause whereby potential lobstermen would have to go through schooling and pass a test to obtain a lobster permit.75

The transfer provision

The one aspect of Chapter 444 that was the most fraught with misunderstanding was the transfer provision. It seems that no one wanted this provision except the Legislature. However, the Legislature wanted this provision very much. To many legislators, operation in a free enterprise society required the ability to transfer licenses. One senator put it this way. If a lobster fisherman has $40,000 in gear, and can no longer go fishing because he has had a heart attack, and there is no mechanism for him to transfer his license with his equipment, then the license just goes by the wayside. However, with the transfer provision, the fisherman has the option of forming a cooperative agreement whereby he can transfer his license after the partnership has been in existence for more than one year. The senator gave a second example of a dragger fisherman, too old to
continue fishing offshore, who wishes to move inside. Obtaining an inshore lobster license would, perhaps require several years effort using the hardship provision. Therefore, with the transfer provision, a free enterprise mechanism exists that allows the older fisherman to join a partnership, and get a commercial inshore lobster license in just over a year. 76

Another legislator suggested that, although free enterprise was the argument used for adding the transfer provision, it was not entire reason. Part of the reason was that the provision placed a value on the license thus allowing a buyer with the highest bid to enter the fishery. He added that the ramifications of this, in terms of the original intent of the law, would not likely have been seen in 1980, especially with this provision being added during the last month prior to the bill’s passage. 77

DMF and MFAC staff have since suggested that the transfer provision may have been added by legislators who knew of the value of licenses, or who knew lobstermen who wanted to attach licenses to their other assets. That is, the provision was added to provide a loophole for constituents. They also insinuated the possibility that Representative MacLain engineered the transfer provision in reaction to having been misled by DMF and MLA in 1979. In any case, the Division and MFAC did not think the transfer provision was too important a factor, at first, because they looked at the law as a gradual phase-out of the
moratorium. On the other hand, MLA was upset because they thought the transfer provision would preclude entry from actually being limited.78

Although it took a year or two for licenses holders to realize the benefits of the transfer loophole, especially with the value it gave to licenses, by 1983, very few were retiring their license. The number of licenses retired since that date can, perhaps, be counted on the fingers of one hand. With this provision, anyone who wishes to enter the fishery who has savvy and money can do so. And anyone would be a fool to give up a license that is worth as much as $15,000. This phenomenon has resulted in an escalation in the number of people fishing in the inshore lobster fishery. Few, if any licenses are retired, 80 fishermen are added from the list each year, and 20 special additional licenses are added each year. Some contend that now, in 1987, Massachusetts does not really have a limited entry system in it's inshore lobster fishery because, with the transfer loophole, it is unable to limit the number of people entering the system. At best, the scheme is slowing down the rate of entry.79

Current considerations

As evidenced by the effect of the transfer provision, effort continued to increase in the lobster fishery through the early eighties. By 1986, lobster industry statistics were showing that transfers were affecting the system by adding effort at an unacceptable rate. This escalating
rate of increase in numbers of licenses coupled with technological improvements, such as new trap types, and the strong economy in Massachusetts thus exerted ever more pressure on the lobster resource. In addition, more and more cases came to the Division's attention of people intentionally manipulating the transfer provision to their own benefit, and making it clear that they had made money on their licenses. Finally, although, the lobster harvest continued to increase, the Division decided that something was going to happen to the resource if they did not act. As a result, DMF began to tighten it's restrictions on transfer and special additional licenses, deciding that too many licenses were being issued.\textsuperscript{80}

The new regulations stated that any license in existence at the end of 1986 could be transferred once. No licenses issued after January 1, 1987 could be transferred, and no hardship licenses could be transferred. To DMF and MFAC these regulations meant that transfers would become less of a factor in the future. However, critics in MLA felt that by the time all present license holders transferred their licenses, there would be no resource left. In addition, they felt that tightening the transfer provision would not cause license attrition because of their premium value.\textsuperscript{81}

Another perennial problem that was greatly intensified by the rapid escalation of inshore commercial lobster permits, was an increase in intra-industry and inter-
industry gear conflicts. The intra-industry gear conflicts occurred because lobsters are only in certain places at certain times, and because new fishermen tended to set trawls where the older successful fishermen were. The inter-industry gear conflicts began to occur because more offshore draggers were being forced to fish closer inshore due to the World Court Canadian boundary dispute outcome, fewer fish, and because lobstermen were increasingly fishing on traditional dragger ground.

Preemption of dragger bottom occurred for two reasons. First, lobstermen were fishing longer seasons (or were storing traps for the winter in inshore waters) and thus had gear in waters used by draggers during the winter months. Second, the incredible amounts of gear being used by lobster fishermen forced many lobster fishermen to seek alternate areas to set their gear. This often turned out to be traditional dragger bottom. To make matters worse, lobstermen’s suspicion that draggers were conducting a directed fishery for lobsters in inshore waters, which is illegal in Massachusetts, exacerbated the growing tensions between these two fisheries. 82

The gear conflict issue, combined with the Division’s current realization of the problems with the lobster licensing system, prompted it to begin consideration of legislative changes to the limited entry law. In 1987, a gear conflict resolution working group was convened, with joint lobster fishery, mobile gear fishery, DMF and MFAC
membership. The purpose of the group was to hammer out regulatory and legislative methods to reduce gear conflicts between the two groups, and to reduce pressure on the lobster stocks by both groups. Out of this process came a legislative package that was submitted to the legislature in late summer, 1987. Included in the package were proposals to make changes in the inshore lobster fishery limited entry law. All transfers would be prohibited except between immediate family. Also, MFAC would determine the number of list and special additional licenses to be issued annually based on the condition of the lobster resource.83

The status of effort controls

Another question is why in the 1980's the lobster fishery still lacks effort controls. The answers to this question are hauntingly similar to the ones given during the 70's. From the DMF and Division of Law Enforcement perspective, there remained questions about whether a trap limitation system could be adequately administered and enforced. From the MLA perspective, to have a trap limit without some adequate curb on entrance into the lobster fishery would not be fair. To MLA it was wrong to demand that those in the industry, who have already made the investment, give up a percentage of their fishing inventory to newcomers.

In addition, both management and industry may well have been lulled into complacency, especially on so contentious
an issue as trap limits, by the continued high harvest of the lobster resource through 1986. However, in 1987, the lobster harvest dropped dramatically, especially north of Cape Cod. Fisheries managers were unsure whether this decrease was due to over-fishing or because of environmental factors (water temperatures for the 1987 season were exceptionally cold, and the spring was extremely stormy). Regardless of what caused this decrease in harvest, the need for effort reduction again came to the fore. A new working group made up of industry and management representatives was formed in early fall, 1987 with the intent of designing effort controls for the inshore commercial lobster fishery, including trap limits. This was the first time since 1976 that a working group had been convened for this purpose.

Conclusion

In reviewing the political history of the Massachusetts commercial inshore lobster fishery, the most striking revelation has been the incredible power that social and economic factors have over the course of events in a social and political system. What matters most seems not to be the biological health of a fishery, or even what will be left for our children. But rather, what seems to supercede all concerns are the current political, economic and social needs of the actors in this extremely complicated game. This is an observation, not a condemnation, for the purpose of this thesis is to approach a better understanding of how
the system we have invented works, with the idealistic notion that such understanding will make the author a more effective fisheries manager.

At the end of his interview, DMF Director Phil Coates stated that he now felt that lobster management is in much the same situation as it was in 1974, with the level of fishing effort at at a point where the lobster fishery stands on a recruitment razor-blade (rather than a knife edge), and it is about to go over the top. What makes this situation all the more scary is that no one yet knows how much more pressure the lobster stocks can take. The next chapter will seek to relate the events of the inshore lobster limited entry program to established limited entry goals and criteria.
NOTES


2 Frank Grice, interview held at the National Marine Fisheries Service Northeast Headquarters, Gloucester, Massachusetts, October 1, 1986 (Hereafter cited as Grice, 1986).

3 Ibid.


5 Representative Robert Gillette, interview held in Pembroke, Massachusetts, March 26, 1987; and Grice, 1986.


7 Ibid.

8 Senator Robert MacLain, interview held as the Massachusetts State House, Boston, Massachusetts, March 4, 1987 (hereafter cited as MacLain, 1987); Philip G. Coates, interview held in Boston, Massachusetts, October 1, 1986 (hereafter cited as Coates, 1986); Grice, 1986; Gillette, 1987; and Peterson, 1986.

9 Peterson, 1986.


15 Coates, 1986; Gillette, 1987; and Barlow, 1987.


Coates, 1986; and Grice 1986.


Ibid.


Coates, 1986.

Peterson, 1986.

Elizabeth Stromeyer, interview held in Sandwich, Massachusetts, February 24, 1987 (hereafter cited as Stromeyer, 1987).


Stromeyer, 1987; Coates, 1986; and Peterson, 1986.


Coates, 1986; and Barlow, 1987.


Ibid.

Ibid.

Ibid.

Ibid.

Ibid.

41 Ibid.

42 Coates, 1986; Stromeyer, 1987; Grice 1986; and Barlow, 1987.

43 Ibid.

44 Grice, 1986.


46 Coates, 1986.

47 Ibid.

48 Roy Tate, interview held in Scituate, Massachusetts, November 3, 1986 (hereafter cited as Tate, 1986); Coates, 1986; and Barlow, 1987.

49 Ibid.

50 Stromeyer, 1987; Tate, 1986; Coates, 1986; and Gillette, 1987.

51 Coates, 1986.


53 Ibid., p. 2.

54 Ibid., p. 5.

55 Ibid., p. 6.

56 Ibid., p. 7.

57 Allen E. Peterson (cover letter to Review of Lobster License Moratorium, provided to the Committee on Natural Resources and Agriculture, March, 1979).


59 Robert Barlow, Statement at Committee on Natural Resources and Agriculture Public Hearing, March 20, 1979.

60 Coates, 1986.
61 Ibid.
62 Coates, 1986; and Peterson, 1986.
63 Peterson, 1986.
64 Coates, 1986.
65 Ibid.
68 Massachusetts Lobstermen's Association (memorandum to membership, 1980).
70 Coates, 1986.
71 Coates, 1986; and Tate, 1986.
72 Stromeyer, 1987; and Coates, 1986.
73 Coates, 1986.
74 Ibid.
76 MacLain, 1987.
78 Gillette, 1987; Barlow, 1987; Stromeyer, 1987; and Coates, 1986.
79 Ibid.
80 Coates, 1986.
81 Tate, 1986.
82 Coates, 1986.
83 Ibid.
CHAPTER V

ANALYSIS

Introduction

To determine whether or not the Massachusetts inshore commercial lobster fishery limited entry program has been successful, the logical progression is to analyze what should happen with a theoretical limited entry scheme in comparison with what actually did happen with this scheme. To achieve this, relevant elements of Chapter 1 are extracted for comparison with the events described in Chapters 3 and 4. Essential elements of limited entry theory are first summarized, and then are compared with the actual inshore commercial lobster fishery license moratorium and limited entry schemes.

Events through 1975

The type of system

As derived in Chapter I, it is recommended that all bases be covered in designing a limited entry plan. The first step in doing this, once the need for some form of entry limitations system is established, is to determine what form of limited entry is needed. This decision was made by DMF and MLA simultaneously with the realization of the need for limited entry. That is, MLA responded to DMF's proposal for effort controls through a trap
limitation program by demanding that entry into the fishery be controlled through a license limitation system. There is no evidence that any other type of limited entry system was considered. However, there is evidence that license limitations had been the primary approach for some time. For example, the initial DMF bill in 1975 would have given the Director power to limit licenses throughout the commercial fisheries. Also, in 1975, MLA filed a bill to reduce the number of commercial permits issued to 1000. These two bills evolved in the legislature into a compromise lobster license limitation bill.

The scope of the plan

The next step is to determine the scope of the plan. There was never serious consideration for extending either trap limits or license limits to the entire inshore lobster fishery; only the inshore commercial fishery was included. Although some consideration was given by MLA to reduce part time fishermen, and to limit the effort of recreational fishermen, these efforts met with only partial success because of the DMF concern for equity.

Who would be allowed in

The determination of who would be allowed in the fishery once the scheme was implemented was only partially considered. The record indicates, that little, if any, consideration was given for grandfathering before the moratorium was implemented, as evidenced by the industry's shock at having no guarantee of license renewal in 1976.
This resulted in the implementation of a grandfather clause amendment in December, 1975, which was almost a foregone conclusion since it went through with so little difficulty. What was not predicted was the addition of the potential requirement that renewal applicants must have fished during the preceding season.

Conditions of entry and exit

Adequate consideration was not given to the conditions of entry and exit. This resulted in the legislature adding its own transfer provision and the notorious hardship provision to the bill.

Total allowable harvest

The total allowable harvest, or effort controls was a major consideration in the design of the license limitation scheme as the need for effort controls was the initial concern that started the whole process. However, rather than keeping effort controls as the primary goal of the process, license limitation was allowed to become the major emphasis. This resulted in the license moratorium being implemented without effort controls.

Longevity of harvest rights

Longevity of harvest rights had already been established, in part, by the commercial fisheries licensing law. All fishermen, including coastal commercial lobstermen, were required to renew their licenses annually. However, the lack of a grandfather provision in Chapter 484, followed by the addition of the fishing requirement
clause in Chapter 729 indicates lack of consideration for other aspects of harvest rights longevity.

Administrative framework

No specific administrative framework for the moratorium was designed prior to passage of the bill. DMF felt that the necessary administrative framework already existed through the licensing bureaucracy. A license limitation program therefore would only effect how the licenses were to be distributed within the existing system. However, the legislature had different ideas and created the need for a whole new bureaucracy by adding the hardship and transfer provisions. DMF and MFAC had no prior warning of this which subsequently forced them to design an administrative framework for the hardship provision while they administered that aspect of the law.

Goals of the plan

Throughout the entire design of a limited entry scheme, the goals of the program must be kept in mind. The goals of the license moratorium were to establish an equitable system that provided economic relief while also limiting effort. While there is no question that these goals were always on the agenda, not all of them came to pass. No effort limitations and no permanent limited entry plan came about as a result of this program despite the study that was supposed to lead to their implementation. Note that the study was supposed to occur during the first year only, but ended up lasting four years. The chronic lack of
success in implementing effort controls that continues to this day demonstrates how keeping goals in mind is not all that is required to get those goals implemented.

Administrative and political feasibility

The administrative and political feasibility of a plan must be determined before the plan is submitted for legislative approval. Administrative feasibility requires consideration of enforcement needs, necessary organizational adjustments and an idea of the costs involved in implementing and administering the plan. Enforcement was not a primary concern with the license moratorium because very few, if any, lobstermen fish commercially without a license. Peer pressure keeps this from happening. As for organizational adjustments and costs, DMF had little idea what would be required because the changes to the bill that most effected these areas occurred while it was in the legislature.

The political feasibility of the plan is the key to what actually happened in passing the lobster license moratorium because the moratorium was designed while it was in the legislature, not before it was submitted. What went to the legislature were two different bills, the MLA bill calling for the distribution of 1000 licenses, and the DMF bill giving the Director the power to limit licenses. The lobster licenses moratorium evolved as a compromise between these two bills while in the Committee on Natural Resources and Agriculture. This meant that, although a great deal of
input was provided by DMF and MLA, the true moratorium architect was CNRA.

With CNRA designing the plan, political feasibility became a primary concern. This is why the moratorium became the only politically expedient measure of the three that were before CNRA during this process. CNRA therefore considered neither the 1000 license limitation for commercial lobster permits, nor the DMF commercial license limitation proposal politically feasible. Political feasibility, as seen by members of CNRA, is also why the transfer and hardship provisions were added to the law.

Summary

The most critical difference when the moratorium was passed, between what the theorists say is supposed to happen in designing a limited entry plan and what actually did happen, is that the moratorium was designed by legislators in CNRA rather than by DMF itself. There was no formal inshore commercial lobster fishery limited entry plan submitted to CNRA.

1975 - 1979

Effects of the measure once implemented

Once a limited entry scheme is implemented certain economic, administrative and biological events theoretically are supposed to occur. For example, the economic health of the fishery will improve because fishermen enjoy stable and secure tenure in the fishery,
there will be reduced loss of economic rent, profitability will stabilize, and the consumer will enjoy enhanced product value. Administrative benefits include fewer fishermen to regulate, decreased management costs, increased management efficiency, and increased concern for the resource by fishermen due to their having acquired vested interest. Biological benefits accrue because fishermen have greater interest in conserving the resource which thus induces effective effort control measures. Limited entry will also reduce entry into the fishery once effort controls produce stock recovery. This provides biological, administrative and economic benefits.

Economic effects

The economic effects of the license moratorium were somewhat different from the above description. First, the moratorium did not place a cap on the number of fishermen. The hardship provision precluded a strict 1300 fisherman limit. It did, however, come very close to this goal. The number of licenses increased from 1,397 in 1975 to 1,438 in 1980; a 3% increase over five years. Second, value began to accrue to the licenses, partly due to the transfer provision, and partly due to entrepreneurial meddling. Third, demand for licenses increased, which placed a great deal of pressure on the system to let new-comers in.

However, the most significant economic effect of the moratorium was that it placed entry restrictions on the fishery without controlling effort. As a result, it did
not decrease dissipation of economic rent. This same conclusion was reached by DMF as evidenced by statements in their 1979 review of the lobster license moratorium.

Administrative effects

Administratively, the moratorium did not live up to theoretical expectations either. Although the law did essentially cap entry, which reduced the total number of people to be regulated over time, other factors militated against reducing management costs and increasing management efficiency. These factors included change in license demand, the hardship provision, the transfer provision, increases in license value, and false catch reporting.

Change in demand for licenses caused both administrative and political pressures. Administrative pressure was created because the only recourse open to most applicants was through the hardship provision. Between 1976 and 1978, an average of 160 applications for hardships were received while an average of 67 were approved by MFAC. Political pressure was created when people desiring hardship licenses asked for sponsorship by legislators who often were not pleased when their requests were turned down. Further political pressure was placed on the system by those who were denied permits and claimed that the system was fixed.

The hardship provision was an administrative nightmare. This provision, as well as the transfer provision, left DMF and MFAC without qualifying criteria. In the former case,
determination of eligibility and definition of "substantial hardship" was left to the DMF Director and MFAC. A combination of MFAC being forced to define criteria, a function that this unpaid citizen body was not designed to do, and the heavy work load placed upon it by the demand for hardships and transfers caused it to devote 60-80% of its time to this issue. This constituted a severe decrease in MFAC's administrative efficiency because it could spend so little time on other fisheries issues.

DMF also suffered a loss in administrative efficiency. As evidenced by its involvement in determining criteria, it was the recipient of the lion's share of political pressure, and was forced to work with long lines of applicants at license renewal time. Both of these cases translate to increased management costs due to the inability of administrators to spend adequate time managing other fisheries.

Increased license value affected administrative efficiency by further increasing demand for licenses. False catch reporting reduced DMF's efficiency in administering the commercial inshore lobster fishery because of the must fish provision of Chapter 729. Fishermen's concerns about IRS audits when DMF started to audit catch reports in 1977 compounded this problem. It is small wonder in 1979, that DMF felt that the moratorium was administratively unwieldy and time consuming.

Biological effects
The moratorium did not meet theoretical expectations of how a successful limited entry program should benefit the resource primarily because effort limitations were not put in place. This caused effort to continue growing throughout the life of the moratorium. DMF believed, in 1979, that excess capacity in the lobster fishery was roughly twice that necessary to harvest the available lobsters. To DMF the major biological rationale behind limited entry was simply to keep fishing mortality from increasing, or at least slow the increase. In this case, the prediction of the theorists came to pass; limited entry, and in particular license limitation, taken alone, will do nothing to slow or reduce effort. The moratorium had no effort controls and effort thus increased dramatically during its five year life.

Summary

The factors most responsible for driving the license moratorium after its implementation were unforeseen circumstances. Two types of unforeseen circumstances occurred. The first were those that manifested themselves as unanticipated provisions of the legislation. These were exemplified by the transfer and hardship provisions, and the must-fish provision of the December amendment. The second were those that occurred in reaction to the moratorium or because of simultaneous events. Change in license demand, increase in license value and increase in entrepreneur acquisition of licenses occurred in reaction
to the moratorium. Simultaneous events that effected the outcome of the scheme included increased demand due to government subsidies resulting from the Magnuson Act, continually increasing effort on the lobster resource, and the lobster resource's ability to withstand this added pressure.

1979 - 1980
Elements of the initial plan

By 1979, DMF was most displeased with the moratorium, and expressed its intention to explore ways to improve the system in its document "Review of the Lobster License Moratorium." CNRA and MLA also reached the same conclusion and 1979 through early 1980 was spent by these three organizations, in some cases working together and in some cases not, hammering out a new system. To review this process, the theoretical points of consideration for the initial planning of a limited entry system from Chapter I will be used.

The type of system

The type of limited entry to use was not determined early on, as it had been in 1975. Instead, although there was still agreement on the use of a license limitation system, DMF and MFAC took different tacks. MLA returned to its initial proposal of the early 1970's to limit the number of licenses to 1000. DMF dusted off the two tier system that had been designed in 1976 and then was tabled. In this case, the compromise legislation whereby the number
of new licenses issued would be balanced with the license attrition rate was decided upon by DMF and MLA before the bill was proposed to CNRA. However, this does not mean that the process went smoothly.

First, MLA’s further restriction bill was tabled by CNRA before DMF reintroduced the two tier system. Therefore, MLA knew that a measure further restricting the number of licenses issued would not fly. This caused them to at least consider the two-tier approach (before they decisively rejected it), which set them up for political problems with the legislature.

Second, DMF already had submitted the two-tier system to CNRA before the compromise moratorium phase-out was accepted by DMF and MLA. This set DMF up for political problems as well because the House majority whip, MacLean, decided to sponsor the bill only to help DMF and to spur discussion on the subject. When CNRA held public hearings on the two-tier proposal, DMF had not told MacLean that they had rejected the bill and were proposing alternate legislation. In addition, MacLean thought MLA would support the two-tier bill. As a result, MacLean was left feeling deceived by both DMF and MLA when he discovered that he was the only one who supported the legislation when it went before CNRA. Mr. MacLean was not pleased with this outcome, and the repercussions of his displeasure affected the outcome of the final bill in 1980.

Third, DMF and MLA represented two differing schools of
thought on what balancing the number of new licenses with the license attrition rate meant. To MLA, this meant that the limited entry system would continue, only with less bureaucracy and fewer of the problems that existed with the moratorium. To DMF, the new compromise was a phase-out of the moratorium. DMF predicted that eventually the licensing system would return to what it had been prior to 1975. As it turned out, both of these predictions were dead wrong.

The scope of the plan

There was never any question about what the new licensing system should cover by any of the parties involved in the negotiation. DMF, MLA and the Legislature all looked at the new system only in terms of its affect on the commercial inshore lobster fishery.

Who would be allowed in

A great deal of concern was expressed for how licenses were to be distributed in the new system. First, a grandfather provision was put into the bill, thus avoiding one problem that occurred in 1975. Second, an elaborate system was developed for placing qualified applicants first, unqualified applicants second, and, after the first year, all other applicants third on a single list. Inherent in this process was the need for experience before being allowed a commercial inshore permit. This whole process occurred while the bill was in CNRA, rather than before it was submitted.
Conditions of entry and exit

The determination of conditions for entry and exit took place at CNRA, and was the most controversial portion of the planning of this bill. It was at this stage that the transfer provision was added to the bill. It was also at this stage that the special additional, or new hardship, provision was added to the bill. Neither DMF or MLA wanted a transfer provision or a hardship provision in the phase-out Bill.

The transfer provision first appeared in an early version of the phase-out in 1979, not long after the two-tier bill had been tabled by CNRA. MLA was incensed by this provision and had it deleted from the final 1979 compromise that carried over into 1980. However, the transfer provision was again added in May, 1980, and managed to survive to become a provision in the final bill, Chapter 444 of the Acts of 1980.

DMF and MLA both believed that a transfer provision would eliminate license retirement because no one would retire their license when they could sell it through a transfer. The transfer provision therefore would allow licenses to be sold at a profit and would preclude their being returned to DMF when lobstermen retired. As a result, both DMF and MLA were adamantly against the inclusion of this provision in the legislation. DMF and MLA both felt that this provision was added at the last minute, and some strong beliefs have been expressed that
the provision was added by legislators on Representative MacLean’s behalf.

The official reason given by legislator’s for addition of this provision was to preserve free enterprise. However, even they allowed that free enterprise was not the whole reason for its inclusion.

The special additional provision was a carry-over of the hardship provision of the original license moratorium. This also was added by CNRA, was opposed by MLA and DMF, and has since caused administrative problems. However, this provision was not anywhere near as controversial as the transfer provision.

Total allowable harvest

Limited entry theory requires that effort controls be included in the original limited entry plan. There was no planning done in 1979-80, by any of the parties involved, to incorporate effort limitations into the new licensing system. The focus was solely on replacing the moratorium with a more permanent system.

Longevity of harvest rights

Longevity of harvest rights, again, carried over from the old system, with licenses being renewed every year, and inclusion of a grandfather clause to protect existing fishermen.

Administrative framework

As with the moratorium, the administrative framework for implementing the new law was partially designed in
CNRA, and partially left for DMF and MFAC to work out. For example, criteria for the special additional provision were left to be worked out by MFAC, and criteria for the transfer provision were left to be worked out by the DMF Director. All transfer and special additional grievances could be appealed to the Commissioner of the Department of Fish, Wildlife and Environmental Law Enforcement. As mentioned earlier, Director Phil Coates managed to avoid the political implications of the Commissioner deciding these appeals by having MFAC vote on the special additional applications in blocks.

Administrative and political feasibility

Little concern was expressed by DMF for organizational adjustments, enforcement and costs before Chapter 444 was passed. The reason for this was that the original bill, as filed with CNRA would have simplified the system considerably over the moratorium. Therefore, costs would have been reduced both in terms of time and money, and organizational adjustments would have been minimal.

Enforcement requirements for this legislation rested primarily on MFAC and DMF. Again, since this new legislation was considered a simplification over the original moratorium, enforcement requirements in terms of devising criteria and deciding on applications, should have been reduced.

The phase-out bill, as it was introduced to CNRA, was not politically feasible. At least this can be said in
20/20 hindsight. Primarily because of the transfer and special additional provisions of the legislation, what went into CNRA and what came out as Chapter 444 were two very different things. Regardless of whether the changes made were because of irate legislators or because of the need to preserve free enterprise, the fact remains that the final version of the bill evolved within the Legislature as a matter of political feasibility.

Summary

Review of the major steps required in formulating a limited entry plan shows that, for the most part, DMF, MLA and CNRA conducted a fairly careful planning process. However, two major omissions to this process took place. First, no effort limitation provision was added to the legislation. Second, adequate consideration for the political feasibility of the plan, under the political circumstances that existed in 1979-1980 did not take place at the planning stage. As a result, major changes that had significant impact on the resulting legislation took place within the Legislature. In effect, DMF and MLA submitted one bill, and a completely different bill emerged.

1980 - 1987

Effects of the measure once implemented

To determine the consequences of Chapter 444 on the inshore commercial lobster fishery, it is again necessary to refer back to the predicted outcome described in Chapter
I. To rehash, outcome can be divided into three parts: economic, administrative and biological. A good economic outcome in limited entry will be reduced loss of economic rent, stable and secure tenure in the fishery, stabilized profitability, and enhanced value of the product to the consumer. An administratively good outcome occurs because there are fewer people to regulate, decreased management costs, increased management efficiency, increased vested interest in the fishery by fishermen, increased concern for the resource by fishermen, and improved cooperation between management and industry. The needs of the resource are fulfilled because effort controls are far more likely when there are fewer fishermen, with vested interest in the resource, who are protected from new-comers should effort controls be successful in improving the resource. Likewise, management becomes more effective, again because of fewer fishermen, but also because of increased cooperation between management and industry. Additionally, protection from new entry when effort limitations are successful is of benefit to the resource.

Economic affects

The most serious economic affect of Chapter 444 in terms of what is supposed to happen with limited entry was the transfer provision. It is ironic that this provision was added, ostensibly to preserve free enterprise, when limited entry is primarily an economic move to improve the economic conditions within a fishery. Therefore, the
transferred provision, which was added to conserve the economic well-being of the fishery by maintaining free enterprise, in fact crippled the economic well-being of the fishery by short-circuiting the potential economic affects of limited entry.

Specifically, over the period from 1980 to 1987, there was no reduction in loss of economic rent. In fact, because of the transfer provision, each lobsterman's share of the pie was reduced. The only event that has tended to mitigate this effect, at least up to the 1987 season, is the continued stability of the resource.

In addition, the continued increase in the numbers of lobstermen, with no retirement of licenses has reduced the long-term stability and security of tenure in the fishery. While it is true that a measure of security exists in knowing that no one will take one's license away (unless they commit a crime), the security ends there. There can be no stability for fishermen working a stressed resource when they know that the numbers of fishermen, and the amount of gear is continually increasing. Gear conflicts, both between lobstermen and between lobstermen and draggermen dramatically illustrate this point. In addition, although the resource has been, up to now, able to withstand the increasing pressure placed on it by industry, there is real concern about how long this can last. When a fishery is severely stressed, the likelihood of recruitment failure increases.
Profitability of fishermen is supposed to be stabilized by successful limited entry. This has not occurred either. Again, increased effort, fishermen and gear conflicts work part and parcel with reduced profitability. Add to this the questionable ability of the resource to withstand much additional pressure, and the safe prediction is that the inshore commercial lobster fishery will become less profitable in the next years. It will become dramatically less profitable if the resource crashes.

It is also difficult to believe that the value of the product can possibly be enhanced with the scenario described above. Increased gear conflict, increased numbers of fishermen and gear, increasingly marginal profits and realization that laws can be circumvented through interstate commerce all serve to reduce the value of the product supplied to the consumer.

Administrative effects

Limited entry is supposed to reduce or at least cap the number of people coming into a fishery, thereby reducing or stabilizing the number of fishermen to be regulated. At least it can be said of the moratorium that it essentially capped the number of inshore commercial lobster fishermen. Chapter 444 rendered mute any discussion of how caps or reductions in the number of fishermen would affect administration because it allowed the number of fishermen to increase at a steady and significant rate. Perhaps it can be argued that the rate of increase is less than it
would have been without the law. In fact, unless this can be argued successfully, there is no limited entry law at all.

Perhaps the law did reduce management costs and increase management efficiency for MFAC because the MFAC role in administrating lobster licensing was significantly reduced. However, for DMF lobster licensing continued to be an administrative thorn in the side. Now, however, the problem was not so much with hardship cases (or special additionals, as they were now called) but with the transfer provision.

Like the initial moratorium, it took a couple of years before people caught on to the fact that something worth getting in on was afoot. In fact a couple of lobstermen retired their licenses in 1981. However, by 1983, no one was retiring their license, and the number of transfers increased significantly. In addition, the number of cases where people intentionally manipulating the system for personal advantage began to increase. DMF was forced to react to this on a case by case basis until 1986, when they began to tighten the transfer provision through regulation. In 1987, DMF is continuing its attempt to tighten the transfer provision through legislation. All of this cost DMF a great deal more in terms of time, money, and decreased management efficiency than should have been the case with a successful limited entry system.

Unfortunately, license transfer was not the only thing
fishery, who will be favorably disposed to effort controls. This is especially true when they know that their reduced capacity (through effort controls) will not be taken up by new-comers. However, this argument is also rendered mute by Chapter 444 because the number of fishermen was allowed to increase, and the amount of effort in the fishery continued to increase.

The matter of effort controls was not considered when the phase-out bill was was written into law. Once Chapter 444 was implemented, much of the Division’s time was spent administering the transfer provision, hardships and gear conflicts. As a result, effort controls were again placed on the back burner. Effort controls have been discussed for the lobster fishery since 1970, but have never been implemented.

Summary

The two major problems with Chapter 444, as illustrated by the description of the effects of the law on the lobster fishery management and economics, were the transfer provision and the lack of effort controls. With the transfer provision, no attrition of licenses took place. With no licenses being retired, and an additional 100 licenses being added every year, the industry continued to grow. This was reduced entry, not limited entry.

The lack of effort controls allowed for continued increases in effort, which was compounded by increased numbers of inshore commercial lobster fishermen.
Increasing numbers of fishermen who are vying for an increasingly limited resource react by increasing the number of traps they’re fishing. Chapter 444 has therefore perpetuated a vicious cycle of growing amounts of gear that may end either when the resource collapses, or as a result of violence due to gear conflicts. It is hoped that, responsible changes to the law in response to the problems it has created will improve management of the lobster resource.
CHAPTER VI

THE EFFECT OF LIMITED ENTRY ON CATCH PER UNIT OF EFFORT

Introduction

One of the primary functions of a fisheries management agency is to formulate policy that is based on the best available scientific, economic and sociological information. Once a management plan has been implemented, it is desirable to assess the impact of that plan on the fishery in question, evaluate its degree of success and then to formulate future policy based on these findings. Such an idealistic chain of events is rife with difficulties, not the least of which is the evaluation of the scientific information which is available concerning a particular fishery. Since the advent of computers, it has become feasible to employ mathematical models in the analysis of data, and several of these models can be of value to fisheries managers when the proper type of data is available. It is of particular value to policy experts to be able to assess the impact of policy as well as to be able to predict, with some degree of precision, future trends in effort, mortality, recruitment and other parameters. The former allows managers to determine the degree of success of implemented policy, and the latter aids in the search for viable future policy. One class of
models that is useful to this end is empirical forecasting models which utilize time-series data to make short-term predictions about the future trend of a particular parameter. With forecasting models, not only can future trends be predicted, but also the effect of policy decisions on a fishery can be evaluated.

A BASIC language time series analysis package called FORCST\(^1\) was utilized to assess whether or not the implementation of the limited entry law in the Massachusetts inshore lobster industry had any effect on catch per unit of effort in this fishery. The program FORCST contains nine forecasting models, each of which produces five year predictions based on the time-series data entered into the program. This package enables the user to determine which of the nine models best fits the data, thus allowing for the predictions to be made based on a model which has been selected as most appropriate. Also, relatively short time-series can be used with FORCST.

**Procedure**

The procedure for using and interpreting FORCST is straightforward. First, the observations for the parameter to be tested are entered and basic statistics, such as the minimum and maximum observations, mean and standard deviation are printed out. Next an autocorrelation function is calculated to determine how much correlation there is between adjacent data points. If there is a trend, whether or not that trend is seasonal can be determined.

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using first difference. As will become clear later, trends in the data can be useful in determining which data set best fits the biology of the animal under study. Following these steps, the program is set for suppressed outputs where no tables or graphs are printed out, and the data set is checked for fit with each of the nine forcasting models in the program. Once this step is completed, the model that best fits the data is determined by finding the result that shows the lowest mean squared error. The program is then reset for lengthy output and run using only the model that carried the lowest mean squared error. The output is then printed in tabular and graph form showing each observed value with its corresponding predicted value as well as showing the predicted values for the five years following the last observed value.

Analysis

The analysis was divided into three parts. First, a determination was made as to which of three data-sets best fits the fishery. Second, using the best data-set, the effect of the limited entry law on catch per unit of effort was analyzed. Third, a look was taken at the future trend in catch per unit of effort if the present limited entry scheme continues.

Initially, three data sets were used, all of which were obtained from the Massachusetts Division of Marine Fisheries Lobster Assessment Project. The first of these data sets was for catch per unit of effort (C.P.U.E.) as
determined by the average number of pounds of lobster caught per trap per year and covered the years 1960-1984. The second data set showed catch per unit of effort in average number of pounds of lobster caught per fisherman per year and covered the years 1967-1984. Both of these data sets were obtained from the annual Massachusetts lobster fishery statistics compiled by the Massachusetts Division of Marine Fisheries. The third data set used catch per unit of effort as determined by the average legal lobster catch per pot haul per month using the seasonal mean and covered the years 1970-1984. This data set came from an on-going impact assessment of the effects of Pilgrim Nuclear Power Station on the marine fisheries of western Cape Cod Bay.

Each data set was divided into three segments. First, the period from the beginning of the data set through 1984 was analyzed, which gave a prediction for the years 1985-1989. Second, the period from the beginning of the data set through 1974, the last year before the license law went into effect, was analyzed producing a prediction for the years 1975-1979. Finally, for comparison with the 1985-1989 prediction produced with the entire data set, the period from 1975-1984 was analyzed. Suppressed analysis was used to determine which model best fit each subdivided data set and lengthy analysis was used to print out the results for each model (see Appendix B).

From this procedure it was determined that, for the
overall analysis, the best data set was catch per unit of effort as determined by average number of pounds of lobster caught per trap per year. There are three reasons why this data set was chosen. First, this time line was the longest of the three and was therefore the most suitable for determining what effect limited entry had on catch per unit of effort when the law was implemented in 1975. Second, the six year cyclic trend displayed in the autocorrelation function seemed to follow the recruitment time for the American lobster more closely than the trends displayed in the other two data sets. Third, the forecasts for 1985-1989 from the 1960-1984 and the 1975-1984 segments of the data set are almost exactly the same. This result is not the case in either of the other data sets.

It was also decided that since the most sophisticated determination of catch per unit of effort came from the Pilgrim Nuclear Power Station impact assessment the prediction for this entire time line, from 1970-1984 might also be of value.

Results and Discussion

In the full length analysis of the 1960-1984 number of pounds of lobster per trap C.P.U.E. data, the double exponential smoothing model was used for both the 1960-1984 and the 1960-1974 periods. For the period from 1975-1984 the single moving average model was used. The results of the analysis for both the 1961-1984 and 1975-1984 periods
showed that the predicted catch per unit of effort would remain the same from 1986-1989, (see Appendix B, table 1 and 2). The result of the analysis for the 1960-1974 period shows a predicted decrease in catch per unit of effort from the years 1976-1979, (see Appendix B, table 3).

The full length analysis of the Pilgrim Nuclear Power Station C.P.U.E. data required the use of the double exponential smoothing model. The result of this analysis showed a prediction that catch per unit of effort should decrease from a high in 1983 to a low in 1988. The 1988 and 1989 predictions showed catch per unit of effort remaining the same, (see Appendix B, table 4).

The most important conclusion that can be drawn from the pounds of lobster per trap C.P.U.E. data is that the prediction for 1975-1979 from the 1960-1974 segment shows a decrease in catch per unit of effort while the actual observations of catch per unit of effort from 1975-1979 show that this parameter stays approximately the same. This indicates that some event or events that took place in 1974 or at the beginning of 1975 may have acted to keep catch per unit of effort at the same level rather than declining. The predictions for 1985-1989 from the entire data set and the 1975-1984 segment both showed that C.P.U.E. stayed the same from 1986-1989. This result served as an indication of the reliability of this particular data set.

Although the Pilgrim Nuclear Power Station data set was
too short to allow for reliable analysis of changes in C.P.U.E. around 1984, it was concluded that given the more sophisticated measure of C.P.U.E. that was used in this assessment, the prediction for the years 1985-1989 would be more reliable than that of the pounds of lobster per trap data set. This conclusion appears to have been supported by actual events. In 1985, lobster landings were higher than in previous years while, during the first several months in 1986, landings have declined\(^5\). The prediction for the Pilgrim Nuclear Power Station data using FORCST shows a peak in C.P.U.E. in 1983 followed by five years of decline (figure 1). Should the observed decline in landings persist for the rest of this year and continue over the next few years, catch per unit of effort will also decline and the prediction made using the Pilgrim Nuclear Power Station data set will be supported. Of course the timing of the predicted peak in C.P.U.E. is off by two years but perhaps this can be improved by using a better measure of C.P.U.E.\.

It should be stated that although changes in trends of catch per unit of effort can be seen, the best one can do is speculate as to their causes. Therefore, all one can say is that these changes in the trend in catch per unit of effort may be the result of the implementation of limited access in the Massachusetts inshore lobster industry. Two additional qualifications must also be kept in mind while reviewing these analysis'. First, in 1984, lobstersmen were
aware that lobster licensing would commence in 1985 and that obtaining a first year license was contingent on their filing a detailed catch report for 1984. Second, V-notching egger females in Massachusetts was discontinued in 1984. As a result of these two events, the landings statistics for the industry that year showed a substantial increase in the number of pounds of lobster caught\(^6\).

It is believed that the reliability of this modeling tool can be increased dramatically under two conditions. First, there is a need for good time-line data. That is, the data must have been collected without any breaks for a minimum of ten observation points prior to the period to be analyzed. In this case, ten years of data without any breaks was needed. Second, the measurement of the parameter being used in the analysis should be reliable. The determination of catch per unit of effort on a yearly basis by dividing the total number of pounds of legal lobster landed by the number of traps is crude to the extreme and therefore decreases the reliability of the forecasts significantly.

Presently, the Massachusetts Division of Marine Fisheries Lobster Assessment Project is collecting time-line data using all lobsters caught in a trap instead of just the legal sized animals. Also, a very sophisticated determination of catch per unit of effort using catch per trap haul per set over day is being employed. Using this measure of C.P.U.E. plus a continuation of the time-line
that has been started, future predictions using C.P.U.E. as the parameter to be analyzed in forecasting models should be increasingly reliable.

Finally, the results of this analysis should be compared with data collected from the Division of Marine Fisheries lobster assessment and statistics projects. Figure 2 illustrates an increase in the total number of pounds of lobster caught in the Massachusetts inshore lobster fishery. This graph shows a dramatic increase in total landings through the early and mid 1980's. In addition, figure 3 shows a gradual increase in catch per unit of effort from the mid 1970's on.

Although, at face value, these data indicate that the Massachusetts inshore lobster resource may be healthier than fisheries managers fear, additional information lends credence to those fears. First, the Division of Marine Fisheries estimates that between 90 and 95% of lobsters reaching legal size are culled as soon as they reach the minimum legal size. Second, the present minimum size limit is shorter than the length of most female lobsters in Massachusetts waters when they first reach sexual maturity. Third, the dramatic increase in the total number of traps over the last two decades (illustrated in figure 3) shows the virtual saturation of Massachusetts coastal waters by lobster gear. All three of these situations serve as indicators that the lobster resource is under severe stress, and that further, more effective
management measures are needed to insure the longevity of the resource. The decrease in catch per unit of effort forecasted in figure 1 may therefore come to pass on short notice.
ACTUAL VS. PREDICTED LOBSTER CATCH PER UNIT EFFORT
1971–1989

CATCH PER UNIT OF EFFORT

YEARS


Actual C.P.U.E.
Predicted C.P.U.E.
CATCH IN MILLIONS OF POUNDS IN THE MASSACHUSETTS INSHORE COMMERCIAL LOBSTER FISHERY, 1888-1986

YEAR

CATCH IN MILLIONS

- NUMBER OF LOBSTER
- POUNDS OF LOBSTER
NOTES


3 This information was obtained with the kind permission of Mr. Bruce Estrella, Marine Fisheries Biologist, Massachusetts Division of Marine Fisheries, South Shore Office, East Sandwich, MA, 02537.


5 Mr. Charles O. Anderson, Personal Communication, Senior Marine Fisheries Biologist, Massachusetts Division of Marine Fisheries, Cat Cove Marine Laboratory, Salem, MA.

6 Mr. James Fair, Personal Communication, Assistant Director, Massachusetts Division of Marine Fisheries, Boston, MA.

7 Figure provided with the kind permission of Mr. Bruce Estrella, Senior Marine Fisheries Biologist, and Lobster Assessment Project Director, Massachusetts Division of Marine Fisheries.

8 Ibid.

9 Mr. Bruce Estrella, personal communication

10 Ibid.

11 Ibid.
CHAPTER VII

SUMMARY

Introduction

Designing and implementing fisheries management schemes in Massachusetts is a four stage process. The first stage is recognition of the problem by the user groups, DMF and MFAC, or the Legislature. The second stage is the initial planning of a new management approach, which usually occurs within DMF, MFAC and the user groups. The third stage is the final planning, development and enactment process, which occurs within the Committee on Natural Resources and Agriculture, and the Legislature itself. The final stage is the implementation, administration and evolutionary process that occurs from the time a new law is enacted to the time it is amended or repealed.

Each of these stages is crucial to determining the eventual affects, and success of a new management approach. For example, in the first stage, the problem must be defined correctly, and realistic goals must be set. The second stage demands cooperation and consensus. The third stage requires close scrutiny by the plan's designers. And the fourth stage demands the courage, tenacity and stamina necessary to maintain course towards the law's goals through amendment, or, if necessary, through repeal.
The first of the two sections in this summary looks at this four stage process as it pertains to the lobster license moratorium in 1975, and to the phase-out law of 1980. This section therefore is divided into three periods: up to 1975, 1975-1980 and 1980-1987. The second section provides conclusions concerning the moratorium and phase-out laws.

**Period Summaries**

**Through 1975**

The period ending in July, 1975, when the lobster license moratorium was enacted, covers the first three of the design and implementation stages of the lobster license moratorium. Initial recognition that increasing effort and numbers of fishermen in the commercial inshore lobster fishery was a serious and growing problem occurred simultaneously between industry and management. If there was any time during the history of the license moratorium when there was consensus, it was during this period.

Consensus seems to break down, however, when different groups harboring differing vested interests decide how best to deal with the problem. When MLA recognized that growing effort in the inshore lobster fishery was a problem, its approach was to reduce the total number of fishermen by focusing on potential competitors: new-comers, part-timers and recreational fishermen. This resulted in a bill to reduce the number of commercial inshore fishermen to 1000. On the other hand, DMF looked at solving the same problem
by increasing the Director's power to include authority to limit licenses in a fishery. As a result, two separate bills were submitted to CNRA, and herein lies the first major mistake of the licenses moratorium. Most all of the planning for the moratorium took place in CNRA rather than before it was submitted to this committee. DMF and MLA would have been better served by CNRA if they had presented a unified front by submitting one bill.

Although there was much cooperation between CNRA, DMF, MFAC and MLA during the period in which the lobster license moratorium bill was at CNRA, the bill was essentially in the hands of the Legislature. The hardship provision, in particular, the requirement that MFAC decide on hardship applications, the claim that lobsters were an endangered species and the amendment requiring that license renewal applicants must have fished during the preceding season all resulted from legislative maneuvering. Had one bill been submitted by DMF and MLA, some of these provisions may have been avoided.

Another serious problem with the planning stages of the moratorium was that the initial emphasis on effort controls was superceded by license limitation. The result of this was a chronic lack of effort controls in subsequent years. The lobster license moratorium would have far better served the needs of industry and management if effort controls had been incorporated into the original legislation.
1975 - 1980

The two most serious problems in carrying out stage four in the license moratorium design and development process were first, that a more permanent form of limited entry was not designed, and second, that effort limitation design did not lead to its implementation. Chapter 484 required that a study be conducted into the design of a more permanent limited entry system and the design of effort controls over the first year of the moratorium. What occurred was that the license moratorium was allowed to continue for five years, replete with flaws that overloaded the bureaucracy and allowed effort to increase unchecked. The law needed to evolve, yet no one forced its evolution.

One aspect of the moratorium that did evolve was administration of the hardship provision. During the first year of the moratorium, hardship applications were dealt with by MFAC on a case by case basis. By the time the moratorium was replaced in 1980, however, this process had been greatly streamlined. As unwilling as DMF and MFAC were in making legislative changes to the moratorium, they proved remarkably resourceful in making it work as best they could.

When the lobster license moratorium was passed in July, 1975, it lacked a grandfather provision. That is, a provision protecting license renewal applicants from losing their licenses. This omission, which instigated the
corrective legislation adding a grandfathering provision, demonstrates another aspect of the evolutionary nature of law-making. No matter how carefully a law is designed, omissions and loopholes requiring corrective action will be found once the law is implemented. Taking this one step further, even the corrective legislation adding the grandfather clause caused the unanticipated problem of false catch reporting during the late 1970's by requiring renewal applicants to have fished the preceeding year.

The period from 1975-1980 was marked, therefore, by two notable successes and one dismal failure. The two successes are as follows. First, the moratorium did what it set out to do; it held the total number of inshore commercial licenses to approximately 1300. Second, DMF and MFAC managed to simplify administration of the law, especially the hardship provision, over a five year period. DMF and MFAC failed, however, to force the moratorium to evolve into a more permanent system, complete with effort controls.

1980 - 1987

Although there was better cooperation between DMF and MLA in the initial planning of the moratorium replacement, DMF and MLA still submitted separate bills to CNRA in 1979. In addition, DMF changed course by submitting the phase-out bill to CNRA after they had submitted the two-tier bill. As a result of these actions, CNRA became closely involved in developing the phase-out bill, so again, most of its
design took place in the legislature. Also, because DMF and MLA withdrew support for the two-tier bill, at least one legislator was misled.

Both the close involvement of CNRA in the planning process, and the influence of perturbed legislators had profound effects on the phase-out bill. The former case dictated that political concerns rather than resource or industry concerns, again, became of paramount importance in crafting the legislation. The latter case may have caused the addition of so liberal a transfer provision, that the beneficial effects of the phase-out were totally erased. However, even with the above factors, MLA and DMF should have had time to act against the transfer provision when it was added to the phase-out bill a full month before it was enacted.

An amazing omission from this entire process was effort controls. Nowhere in the designing process for the moratorium replacement in 1979 and 1980 can one find an attempt to add effort controls. Although this probably resulted from pressures by industry and the Legislature to change what already existed, the blame for this must lie primarily with DMF. Lack of effort controls in the new plan shows that management failed to realize that part of the problem with the moratorium was increasing effort.

Furthermore, since DMF and MFAC realized that effort controls are fundamental to the design of any limited entry plan, this omission indicates that management was more
reacting to pressures to change the system than taking the initiative to design a comprehensive replacement for the moratorium. Apparently management was more concerned about putting out political fires than it was about designing a better system for managing the inshore lobster fishery.

Chapter 444 therefore failed as a direct result of the transfer provision and the omission of effort controls. Three major negative effects of this law are evident. First, the number of fishermen coming into the fishery has increased at a significant rate since its implementation. This has occurred because no licenses are retired when they can be transferred at a profit. Second, effort has grown so that lobsters have continued to be fished at the stock-recruitment knife edge. This has occurred because lobstermen react to reduced catches by increasing the number of traps they fish. Traps are also used on occasion to preempt bottom from use by other lobstermen or by draggermen. Third, intra and inter-industry gear conflicts have worsened largely because of the growth in numbers of lobstermen and amounts of lobster gear.

There are three reasons why Chapter 444 has failed. First, no clear goals existed prior to designing the new plan. MLA thought that the phase-out was a continuation of limited entry, while DMF thought it was a phase-out of the moratorium. Who knows what the Legislature thought they were designing. Clear goals would have required industry and management consensus, and, regardless of what replaced
the moratorium, some type of effort controls. Second the initial planning was not coordinated between all vested parties. Because of this, most of the bill's design occurred after it had been submitted to CNRA. The new bill's design was therefore partially out of the control of those most competent to design it. In addition, no effort controls were added, which is an inexcusable omission to those most familiar with limited entry.

Third, the law did not evolve after its problems were identified. It is only now, in 1987, that the matter of tightening the transfer provision and seriously studying effort controls has again come to the fore.

Summary Conclusions

The moratorium and phase-out laws

The primary conclusion that must be reached in looking back on 12 years of entry controls in the inshore commercial lobster fishery is that the system has failed to reach any of its goals. The goal of the moratorium was to cap entry into the lobster fishery to keep matters from deteriorating while management designed a more permanent limited entry system and decided on how best to reduce effort in the fishery. The first part of this goal was achieved in that entry into the fishery was essentially capped for the next five years. The lion's share of this goal was not achieved because despite intensive study, no permanent limited entry system with effort controls was ever designed, much less promulgated. Since the moratorium
lacked effort controls, effort among those left in the commercial inshore fishery continued to increase. Therefore, even the cap was far from complete. One reason for this situation is that DMF and MFAC lost the forest for the trees as they became involved in administering the pitfalls of the moratorium.

The only goal of the phase-out bill was to find a replacement for the moratorium because it had gone on too long. This goal was achieved. However, even though much planning went into finding a replacement for the moratorium, the planners neglected to recall the original goals they had set out to achieve in 1975.

As it was, the phase-out served different purposes to different groups. To MLA, it maintained some form of limited entry. To DMF, it was supposed to phase-out limited entry. To the Legislature, it was a chance to maintain "free enterprise." The only one of these three groups that got what it wanted was the Legislature. Since 1980, effort and numbers of inshore commercial lobster fishermen have continued to increase, while the fishery and the stocks themselves have both continued to suffer.

Quasi limited entry in the inshore commercial lobster fishery therefore has not fulfilled any of the theoretical economic, administrative or biological goals found in limited entry literature. Dissipation of economic rent has continued, as evidenced by increasing numbers of fishermen and amounts of gear, and as evidenced by decreasing catch
per unit of effort. Both laws have been administrative and political fiascos because they decreased the efficiency of fisheries management while increasing the costs of management. They also forced DMF and MFAC to lose sight of the goals they were originally attempting to achieve through limited entry.

Meanwhile, because effort controls were never incorporated into the management plans, the condition of the inshore lobster stock has become increasingly tentative. In the early 1970's, DMF was saying that the lobster stock was being fished at the recruitment knife edge. Now they are saying that the stocks are being fished on a razor edge.

Systemic effects

Although it is easy to place blame on one organization or another for the outcome of a law such as the two inshore commercial lobster fishery limited entry laws, one must look at the influence of the system on the process of law design, implementation and administration to draw a more realistic picture of why policy failure takes place. These may be termed systemic influences.

The first, and perhaps most important, of these systemic effects is the process of law design, implementation and administration within the Commonwealth. Massachusetts has a relatively open process whereby industry, MFAC and DMF all take part in designing and implementing marine fisheries laws. As a result,
legislation evolves from either coordinated or uncoordinated industry and management design.

Proposed bills then go to CNRA. At this stage there is, at one level, a great deal of communication and input from all concerned parties, while at another level, opportunities exist for the legislature to add provisions of its own without direct constituency or management input.

Once a bill has been modified, or a new bill designed by CNRA, it goes to the legislature where the only constituency or management influence is on individual legislators. As a bill proceeds from one stage to the next, constituency and management influence therefore decreases.

The effects of this process on fisheries management laws are twofold. First, a classic case of "too many cooks spoiling the broth" exists because so many different interests exert influence on the outcome of a law. The plus side of this is that management initiatives cannot take place arbitrarily, and in direct opposition to the desires of the public. The negative side of this is that by the time a law is enacted it has been watered down significantly from what it was originally intended to be.

The process outlined above also demands that administrators be prepared to force the continued evolution of policy towards the goals originally envisioned when the law was first designed. The process dictates that each policy, each law, is a step on the road towards the goals
of management.

Forcing the process to evolve is an easy concept to explain and defend, but very difficult to implement. No changes were made either to the moratorium or to the phase-out for a number of years after they were enacted despite the presence of severe, crippling problems with both laws. The reasons for this remain unclear, but are systemic, and do allow room for some speculation.

There are a couple of likely reasons why the laws did not evolve in a timely manner. First, although 5 to 7 years may seem an eternity when a law is difficult to administer, in the long run this is not a particularly long period at all. It may be that our system demands several years of working with an existing law before enough evidence can be obtained to justify making necessary changes. Put another way, the legislature would not take kindly to DMF requesting major changes to a law that they had just spent considerable time and energy enacting. If this rationale is correct then the situation requires that enough administrative latitude be put into a law so that regulatory initiatives can take up the slack until it is feasible to amend the law.

Also, the design and promulgation of laws takes a great deal of time and energy in excess of the normal duties of industry and agencies. As a result, there likely exists a tendency by management and industry to put up with a law for a time after it has been implemented, regardless of its
pitfalls. Designing regulatory latitude, again, into the law is probably the best way to continue the process towards established goals while letting the legislative sleeping dog lie.

An additional systemic effect is the existence of unanticipated concurrent events. Increased demand for lobster licenses resulting from the Magnuson Act in the late 1970's exemplifies this. Another example is stock recruitment failure. The best way for management to prepare for these events is, again, to maximize their regulatory latitude in designing fisheries laws.
CONCLUSION

What should be done?

The single most important thing that DMF, MFAC and industry can do at this point is to look at the history of inshore lobster management since 1970, when effort was first recognized as growing, and learn from the lessons of the past. It is only through recognition of exactly what mistakes were made that the same mistakes can be avoided, and the process can be moved towards its goals. This was not done in 1979 and 1980 and the result, from 1980 through 1987, was a worse situation than what existed in 1979.

The second most important realization that comes from reviewing the history of these two laws is that formal limited entry has yet to be tried in the Massachusetts inshore commercial lobster fishery. Therefore, it cannot be argued that limited entry has been proven an inappropriate management approach for this fishery.

More importantly, there is compelling reason why limited entry should continue. First, if the administrative, economic and biological goals of limited entry can be reached, then the overall situation in the inshore lobster fishery will improve. Second, gear conflicts are becoming an ever more important issue in inshore fisheries management. There are simply too many fishermen fishing too limited a resource in too limited an
area. The only long term solution to this situation is some form of limited entry.

Given these realizations, there is no better time than the present to go forward with a concerted attempt to incorporate limited entry into a new management plan for the Massachusetts inshore lobster fishery in its entirety. The following is what should be done.

Proposal

Two initial actions should take place concurrently. The first of these is to tighten the loopholes in the present law either through regulation or through legislation. This is now being done by DMF and MFAC. The second is to charge the MFAC working group, that was formed in early September 1987, with designing a new comprehensive management plan for the entire inshore lobster fishery. This plan should encompass all users of the Massachusetts inshore lobster resource. The plan should include provisions for a formal, permanent limited entry system complete with effort controls for the inshore commercial lobster fishery.

The feasibility of extending this limited entry to other aspects of the inshore lobster fishery should also be explored. For example, limiting the number of recreational licenses issued each year should be discussed, as should increases in license fees.

Effort controls should be equitably distributed
throughout the inshore lobster fishery, and these controls must be implemented simultaneously with other management actions. The history of the two limited entry laws demonstrates that implementing other management schemes prior to effort controls precludes their timely implementation. If there is any single lesson to be learned from this review, it is that effort controls must always remain at the forefront of the planning process. Continued relenting on that point will cause the demise of the inshore lobster resource.

For the commercial inshore lobster fishery, effort controls should include a trap limit, trawl length limits and limits on the number of traps allowed on a trawl. In addition, the number of traps allowed for recreational and student license holders should be reduced. Also, a bag limit should be placed on divers and an enforceable law on dragging for lobsters in inshore waters should be implemented.

Enforcement of the lobster licensing law should be aided by implementing stiffer penalties for convicted law-breakers. Ten and twenty-five dollar fines with no license suspension do not bring about the desired effect.

Finally, the commercial inshore licenses should be made regional so that differential trap maximums can be designed for each region, and so lobster spawning closures can be put in place while lobsters are molting in each region.

Close coordination within the working group should take
place in designing the new plan so that one bill, filed jointly by industry and management, is filed with CNRA. Furthermore, this bill should be so carefully formulated that by the time it is filed, the industrial and management course is set and a united front is shown to the Legislature.

Prior to the bill being filed with CNRA, coastal legislators should be apprised of the plan, and won over to the cause. During its residence with CNRA, very close observation of the process should be undertaken by the working group. In addition, this close observation and communication should continue when the bill is submitted to the Legislature. All of this will mitigate the tendency for legislators to make unanticipated changes to the bill.

Realizing that omissions and unanticipated changes to the bill may well take place, DMF and MFAC should do two things in addition to maintaining dogged communication with the Legislature. First, administrative latitude should be designed into the bill. Second, management should be prepared to make necessary administrative changes, or to submit corrective legislation after the bill is passed. These organizations should also do their best, through good communication with the Legislature, to anticipate additions and deletions to the law.

Finally, fisheries managers must realize that the new law will only be a step in a continuing process towards the goals set in the initial plan. It must therefore be
prepared to make continuing administrative and legislative adjustments to force the plan's evolution towards management's goals.

While there is no question that inshore fisheries management is a complicated process, with many players and multiple pitfalls, the fact remains that it is a process. Whether management actions are premised on knowledge of past events, or as reactions to political and administrative brush fires, the process will continue. The purpose of this review has been to premise future actions on detailed knowledge of past events with the belief that the process will advance far more positively and decisively with this knowledge.

The author's overriding belief is that this knowledge can be applied, during the next several months, in a manner that will significantly improve lobster fishery management in the Commonwealth of Massachusetts. In any case, the Massachusetts inshore lobster fishery is at a crossroads. Careful evaluation and forthright action are essential if collapse of this fishery is to be avoided.
AN ACT FURTHER REGULATING THE ISSUANCE OF COMMERCIAL FISHERMAN PERMITS FOR THE TAKING OF LOBSTERS IN COASTAL WATERS.

Whereas, The deferred operation of this act would tend to defeat its purpose, which is to establish immediately safeguards for the preservation of an endangered food species, namely lobster, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Chapter 130 of the General Laws is hereby amended by inserting after section 38A the following section:-

Section 38B. Notwithstanding the provisions of section thirty-eight, the director shall not issue more than thirteen hundred commercial fisherman permits for the taking of lobsters in coastal waters annually, provided, however, subject to the approval of the marine advisory commission, he may issue up to one hundred and thirty additional permits if the applicant had been issued a commercial fisherman’s permit for the taking of lobsters in coastal waters for any year since nineteen hundred and seventy or if he finds that the applicant would suffer a substantial hardship if the permit were not granted.

Any commercial fisherman permit for the taking of lobsters in coastal waters under this chapter held by an individual, partnership or corporation may be transferred to any individual, partnership or corporation qualified to receive such a permit in the first instance if, in the opinion of the director, such transfer is in the public interest. If the director determines that an individual, partnership or corporation is not entitled to a transfer as aforesaid of a permit granted by them, the applicant for such transfer may appeal to the marine advisory commission, and the decision of the commission upon such appeal shall be final.

In the case of the death of an individual holder of any permit under this chapter, such permit, unless earlier surrendered, revoked or
cancelled, shall authorize the executor or administrator of the deceased permittee to exercise all authority conferred upon such permittee until the termination thereof.

SECTION 2. The division of marine fisheries is hereby authorized and directed to investigate and study rules and regulations relative to the issuance of commercial fisherman permits for the taking of lobsters in coastal waters with special emphasis on developing a system for the issuance of such permits plus regulations for limiting the amount of gear that can be used in coastal lobster fishing. The division shall report to the general court the results of its investigation and study and its recommendations, if any, together with drafts of its legislation necessary to carry its recommendations into effect by filing the same with the clerk of the house of representatives not later than the first Wednesday of December in the current year.

Preamble adopted, Thomas W. McLee, Speaker.

In Senate, July 3, 1975.

Preamble adopted, Acting President.


Bill passed to be enacted, Thomas W. McLee, Speaker.

In Senate, July 1, 1975.

Bill passed to be enacted, Acting President.

July 14, 1975.

Approved, at 2 o'clock and 15 minutes, 4 P. M.

Governor.
AN ACT FURTHER REGULATING THE ISSUANCE OF COMMERCIAL FISHERMAN PERMITS FOR THE TAKING OF LOBSTERS IN COASTAL WATERS.

Whereas, The deferred operation of this act would tend to defeat its purpose, which is to establish immediately safeguards for the preservation of an endangered food species, namely lobster, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section 38B of chapter 130 of the General Laws, inserted by section 1 of chapter 484 of the acts of 1975, is hereby amended by striking out the first paragraph and inserting in place thereof the following paragraph:

Notwithstanding the provisions of section thirty-eight, the director shall not issue more than thirteen hundred commercial fisherman permits for the taking of lobsters in coastal waters annually. The director may give priority in the issuance of such permits for a new calendar year, consistent with the provisions of this section, to applicants who have held such a permit and fished for lobsters during the preceding year. Subject to the approval of the marine advisory commission, the director may issue up to one hundred and thirty additional permits if the applicant had been issued a commercial fisherman's permit for the taking of lobsters in coastal waters for any year since nineteen hundred and seventy or if he finds that the applicant would suffer a substantial hardship if the permit were not granted.

Preamble adopted, Speaker.
In Senate, November 24, 1975.

Preamble adopted, 

President.

House of Representatives, November 25, 1975.

Bill passed to be enacted. Speaker.

In Senate, November 26, 1975.

Bill passed to be enacted. President.

December 8, 1975.

Approved, at 5 o'clock and 10 minutes, P. M.

Governor.
AN ACT PROVIDING FOR THE DISTRIBUTION OF COMMERCIAL FISHERMEN PERMITS FOR THE TAKING OF LOBSTERS IN COASTAL WATERS.

Whereas, The deferred operation of this act would tend to defeat its purpose, which is to provide immediately for the distribution of commercial fishermen permits for the taking of lobsters in coastal waters, therefore, it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Section 2 of chapter 130 of the General Laws, as appearing in section 1 of chapter 598 of the acts of 1941, is hereby amended by striking out the first paragraph and inserting in place thereof the following paragraph:-

Licenses, permits and certificates of registration issued by the director shall not except as otherwise provided in this chapter be transferable and shall be produced for examination upon demand of any authorized person.

SECTION 2. Said chapter 130 is hereby further amended by striking out section 38B, as amended by chapter 729 of the acts of 1975, and inserting in place thereof the following section:-

Section 38B. During the permit renewal period of December first to March first of each year, the director shall renew an existing commercial fishermen permit for the taking of lobsters in coastal waters held by any person during the previous year. From January first to March first, nineteen hundred and eighty-one, new applicants may apply for a commercial fishermen permit for the taking of lobsters in coastal waters on forms to be supplied by the director. All such new applications shall be made by registered mail only. The director shall review and act upon each new application in the order of its receipt by the division. The names of those new applicants, determined by the director to be experienced and qualified to enter the coastal lobster fishery, shall be placed by random selection on a list. All other applicants determined not to be experienced and qualified to enter the coastal lobster fishery shall thereafter be placed on said list by random selection. Said list shall be
§ 6544

maintained by the director on a continuing basis, and updated as necessary, filed with the state secretary, sent to the clerk of each coastal city and town and made available to the public upon request. The director may issue no more than one hundred commercial fishermen permits for the taking of lobsters in coastal waters for the calendar year nineteen hundred and eighty-one, nor more than eighty such permits during any calendar year thereafter, to those persons experienced and qualified to enter the coastal lobster fishery. Experience and qualification to enter the coastal lobster fishery as used in this section shall be based upon the following criteria: (1) Six months of full time experience in the commercial lobster fishery, or twelve months full time experience in other commercial fisheries or a combination thereof and (j) commitment to participate in the coastal commercial lobster fishery.

The director may issue up to thirty permits in nineteen hundred and eighty-one, and twenty additional permits for each year thereafter, to those individuals who have been previously engaged in commercial fishing, and can demonstrate that the majority of their income originates from commercial fishing, and that due to documented personal medical incapacity, or other unforeseen circumstances or Acts of God, they were unable to obtain a commercial lobster license during the prescribed renewal period. The marine fisheries advisory commission shall establish criteria to assure that the intent of this section is carried out. Forthwith upon the establishment of such criteria, the said marine fisheries advisory commission shall file a copy thereof with the clerks of the senate and house of representatives.

Any applicant for such a permit or a transfer of any existing permit aggrieved by a decision of the director may appeal that decision to the commissioner whose decision upon such appeal shall be final. The commissioner's decision, however, shall be governed by the criteria contained in this section.

All applicants issued a commercial fisherman permit for the taking of lobsters in coastal waters shall document their catch and sale of lobsters at such times and upon such forms as may be determined by the director. Individual catch data so documented shall be confidential and shall not be disclosed except in aggregate form. The director may develop such forms and require such information as he deems necessary in the administration of this section. All such forms shall be signed by the applicant under the pains and penalties of perjury. Failure to submit complete forms as required by this
section, or falsification of any such form or any application as required by
this section shall result in a fine of not less than five hundred nor more than
one thousand dollars and immediate suspension of the commercial permit for one
year for the first offense, two years for the second offense and three years
for each subsequent offense.

Commercial fishermen permits for the taking of lobsters in coastal waters
may be transferred subject to the approval of the director, between members of
an immediate family. A permit may be transferred to a lawful member of any
corporation, partnership, joint venture, firm, business, company, franchise,
association, organization, holding company, joint stock company, or any other
legal entity when such an entity is lawfully dissolved as defined in chapters
one hundred and eight A and one hundred and fifty-six B provided that said
entity had been in lawful existence for more than one calendar year and
provided further that the applicant for this transfer is experienced and
qualified to enter the coastal lobster fishery. The director may develop
additional criteria by which such transfer applications will be reviewed.

SECTION 3. Section two of this act shall take effect on December first,
nineteen hundred and eighty.
AN ACT MAKING CORRECTIVE CHANGES IN THE LAW PROVIDING FOR THE ISSUANCE OF COMMERCIAL LOBSTER LICENSES.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section 38B of chapter 130 of the General Laws, as most recently amended by section 2 of chapter 444 of the acts of 1980, is hereby amended by striking out the second paragraph and inserting in place thereof the following paragraph:-

The director may issue up to thirty permits in nineteen hundred and eighty-one, and twenty permits in each year thereafter, to those individuals who have been previously engaged in commercial fishing, and can demonstrate that the majority of their income originates from commercial fishing, and that due to documented personal medical incapacity, or other unforeseen circumstances or Acts of God, they were unable to obtain a commercial lobster license during the prescribed renewal period. The marine fisheries advisory commission shall establish criteria to assure that the intent of this section is carried out. Forthwith upon the establishment of such criteria, the said marine fisheries advisory commission shall file a copy thereof with the clerks of the senate and house of representatives.
APPENDIX B

CHAPTER VI CATCH PER UNIT OF EFFORT FORECAST DATA
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**MINIMUM** = 20  
**MAXIMUM** = 41  
**MEAN** = 28.76  
**STD DEV** = 5.974113

**TIME SERIES**: MA INSHORE LOBSTER FISHERY CPUE AVERAGE LBS PER POT 1969-1984

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207
## TABLE 1B

### DOUBLE EXPONENTIAL SMOOTHING

**TIME SERIES FOR INSHORE LOBSTER FISHERY CPUE AVERAGE LBS PER POT 1960-1984**

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Initial Estimate of Slope = 0
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Last Period Estimate of Slope = 3.5872496

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**NUMBER OF OBSERVATIONS** 24

**MEAN % ERROR OF OBS** .1826786

**MEAN ABSOLUTE % ERROR** 11.48678

**MEAN SQUARED ERROR (MSE)** 5.57987

**MEAN ABSOLUTE ERROR** 3.117583

### POT 1968-1984

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**Initial Estimate of Intercept** 38
**Initial Estimate of Slope** 0
**Last Period Estimate of Intercept** 29.67293
**Last Period Estimate of Slope** 3.5872496

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### Table 2A

**Total No. of Observations = 15**

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**Minimum = 20**

**Maximum = 41**

**Mean = 29.6**

**Std Dev = 7.248643**

**Time Series: MA Inshore Lobster Fishery CPUE Average Lbs Per Pot 1948-1974**

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209
TABLE 2B

**DOUB T EXPO NENTIAL SMOOTHING**

**TIME SERIES: MA INSHORE LOBSTER FISHERY CPUE AVERAGE LBS PER POT 1968-1974**

**ALPHA** = .3

**INITIAL ESTIMATE OF INTERCEPT** = 38

**INITIAL ESTIMATE OF SLOPE** = 0

**LAST PERIOD ESTIMATE OF INTERCEPT** = 22.34086

**LAST PERIOD ESTIMATE OF SLOPE** = -.7468814

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**MINIMUM = 21**

**MAXIMUM = 31**

**MEAN = 27.5**

**STD DEV = 3.24037**

**TIME SERIES: MA INSHORE LOBSTER FISHERY CPUE AVERAGE LBS PER FOT 1975-1984**

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  - 0.00
  - 0.50
  - 1.00

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**SMAVE-2 periods**

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**NUMBER OF ERROR OBSNS | 8**

| MEAN % ERROR OR BIAS  | 4.328644  |
| MEAN ABSOLUTE % ERROR | 7.459223  |
| MEAN SQUARED ERROR (MSE) | 6.75    |
| MEAN ABSOLUTE ERROR   | 2.125     |

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**Autocorrelation**

- **SMAVE**
  - 1p
- **LMAVE**
  - 2p
- **REGRESS**
  - 3p

**TIME SERIES:**

- **LOTTERY FISHERY PERE GROIN NUCLEAR POWER STATION CPUE AVERAGE LEGAL LANDFISH CATCH PER FISHERIE, PER MONTH FOR ALL SUBRACES COMBINED 1970-1984**

**PAUSE**

**NUMBER OF ERROR OBSNS**

- **14**
- **SMVE**
- **1p**
- **LMAVE**
- **2p**
- **REGRESS**
- **3p**

**NUMBER OF ERROR OBSNS**

- **12**
- **SMVE**
- **1p**
- **LMAVE**
- **2p**
- **REGRESS**
- **3p**
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**SINGLE EXPONENTIAL SMOOTHING**

**TIME SERIES:**

MA INSHEEK LOBSTER FISHERY FISHING NUCLEAR POWER STATION CPUE AVERAGE LEGAL LOBSTER CATCH PER FISH Haul PER MONTH FOR ALL QUADRATS COMBINED 1970-1984

**ALPHA = 0.1**

Initial smoothed average = 0.58

Last period estimate of smoothed average = 0.5730405

**NUMBER OF ERROR OBSNS**

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214
BIBLIOGRAPHY


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