# An Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab

*Prepared for*
**Maine Department of Marine Resources**


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# Executive Summary

## 1. Background

This project was initiated by the 125th Maine State Legislature, which directed the Maine Department of Marine Resources to contract for an independent evaluation of the existing limited entry licensing system in Maine's lobster and crab fishery (RESOLVE Chapter 62, LD 1532). The Legislature specified in LD 1532 that the analysis must include an evaluation of the limited entry system, and determine whether the benefits, including the benefits of conservation, outweigh the costs, including the impact of restrictions on entry to the lobster fishing industry.

The Department of Marine Resources (DMR) subsequently awarded a contract to the Gulf of Maine Research Institute (GMRI) through a competitive bid process on July 10, 2012 to undertake the evaluation. DMR asked for both an objective and analytical evaluation of the current limited entry system as well as a range of recommendations for addressing any deficiencies identified in the current system. GMRI undertook an extensive research and analysis that included an intensive outreach effort in the form of public meetings, two mail-in surveys, and a public comment phone line that received over a hundred inquiries, all of which got a personal response.

## 2. Overview of Limited Licensing System

There are four types of commercial lobster licenses that allow a Maine resident to harvest lobsters for sale. The three primary types, which represent the bulk of the commercial fleet, are distinguished by the number of additional crew allowed on the vessel when hauling traps: Class I (no additional crew), Class II (one additional crew), and Class III (two additional crew). The fourth license type, the Student License, is available to full-time students under 23 and is restricted to a maximum of 150 traps.

Anyone wishing to get a commercial license must complete the Apprentice Program for the zone in which they wish to fish. To do so, they must hold either a Student License or an Apprentice License (Apprentice License holders cannot commercially fish any of their own traps). Student license holders who complete their zone's apprentice program before they turn 18 are eligible to obtain a commercial license immediately; all others join a waiting list for their zone. Commercial licenses are granted to members of the waiting list according to their zone's exit-to-entry ratio, meaning several licenses – or more specifically, their associated trap tags – must be retired (or not renewed) before a new one is granted. Zone C does not have a waiting list; instead anyone who completes their Apprentice Program is eligible for a commercial license. Finally, there is a recreational license category, which limits holders to five traps. This report does not address recreational licenses.

### *2.1 State of the Fishery*

*Management status*
The coast is divided into seven Lobster Management Zones, each of which has a Zone Council that can adapt state-wide regulations to reflect regional circumstances. Maine's lobster fishery is managed through a system that limits the number of commercial licenses, combined with

conservation measures that determine the size and reproductive state of lobsters that may be harvested. There is a statewide limit of 800 traps per license (although Zone E has a 600-trap limit). An owner-operator provision that requires the license-holder to be on board the licensed vessel when hauling traps. License holders must purchase trap tags for each trap they want to fish.

*Biological status*
Maine's lobster fishery has seen two decades of dramatically increasing landings from 57 million pounds in 2000 to 105 million pounds in 2011. According to the Atlantic States Marine Fisheries Commission's most recent assessment, the stock is healthy and fishing is occurring at a sustainable level. But there is uncertainty about the future robustness of the stock. A new stock assessment scheduled for 2013 may reveal changes in its status.

*Economic status*
As the landed pounds have increased in Maine, the price fishermen receive for their catch has fluctuated, peaking in 2007. The global economic recession of 2008 suppressed lobster prices, which have remained below pre-2008 levels. The lobster harvest in 2011 was worth $335 million. When adjusted for inflation, however, the price per pound that vessels received in 2011 was equivalent to their price in 1960. When a standard multiplier of is applied to the harvest value, accounting for the fishery's wider economic impact, the value rises to over $1 billion.

*Fishery status*
In 2011, there were 4,933 commercial (Class I, II, or III) license holders, who bought a total of 2,876,388 tags. In addition, there were 761 Student License holders with 49,238 tags and 269 Apprentice License holders (who cannot buy tags). However, not all license holders actively fish. Indeed, 1,107 commercial licenses did not record any landings in 2011, 22% of the total. These inactive licenses account for 14% of issued tags. The overall effect of the exit-to-entry ratios established in most zones has been a decrease in the number of licenses. Meanwhile, the number of Class II and III licenses (those allowing additional crew members) has climbed relative to Class I. Average boat length has increased as well, indicating growing capacity. This has not resulted in a decrease in effort, however, because trap tags issued has increased.

## 2.2 Evaluation of Current System - Key Findings

GMRI was asked to identify deficiencies in the current limited entry system and to make recommendations on how to address them. In our analysis of the system, we have identified four key deficiencies, for which we offer recommendations: latent effort, long waiting periods, under-accounting of retiring tags, and an inadequacy of the system to respond to a resource decline. In addition, our outreach effort revealed several additional deficiencies. These may either be perceptions that our analysis does not fully support or that are too subjective to analyze.

It is essential to understand that these deficiencies and recommendations address social and economic concerns exclusively and do not address lobster resource conservation. Since the current limited license system does not control effort (as witnessed by the steady increase in traps), it is not the basis for a conservation strategy for Maine's lobster fishery – other conservation measures and ecological conditions are responsible for the past two decades of growing harvests. Thus, any changes to the limited entry system would address only social and economic issues related to who

gets the privilege to fish. Making such decisions therefore entails making trade-offs between the profitability of existing fishermen and potential profitability of new entrants. Further, we urge the State to consider longer-term impacts that changes to the system might have on future management options in the event that the lobster resource declines. Finally, the current system has defining characteristics that are serving their intended purpose and should not be changed, such as limited entry, nontransferable licenses, and the owner-operator provision.

### 2.3 Deficiencies in the current system revealed in GMRI's analysis:

*Latent effort*
Latent effort refers to unused potential effort in a fishery. It takes three primary forms in Maine's lobster fishery: commercial licenses that have been issued but are not being used; trap tags that have been issued but not being fished; and the potential traps associated with licenses holders who do not currently buy their maximum allowable number of tags.

GMRI estimates that 391,142 trap tags which have already been issued could be actively fished right away, and another 845,444 new traps could be issued immediately to eligible fishermen. This indicates that a combined total of 1,236,586 additional traps could enter the state's waters, if all license holders purchased tags for, and fished, their maximum number of traps. That represents a potential 39% increase in existing effort. Most of that potential additional effort resides with licenses that harvested less than 10,000 pounds in 2011.

Latent effort represents a risk to the fishery because this high level of potential new effort would dramatically increase the pressure on the lobster resource. In a fishery where gear congestion is already an issue, additional traps would also cause increased competition on the water. Finally, latent effort threatens the profitability of current active fishermen because additional vessels would compete for the same lobsters since a very high percentage of the legal lobsters are harvested every year.

*Long waiting periods*
An issue that motivated the Legislature's desire for this analysis was the length of time people spend on the waiting list to get a commercial license. GMRI's analysis suggests that the average time people have been on the waiting list is six years so far. With an average of 60 new licenses being issued every year, including those issued in Zone C, and roughly 14 of those going to people on the waiting list in limited entry zones (the other portion going to qualifying students under 18 and those in Zone C), it could take 20 years or more for all 296 current waiting list members to get a commercial license (although those at the top of the list would get theirs much sooner, and 41 of these individuals are zone transfers). Limited entry and exit-to-entry ratios are therefore reducing licenses.

*Under-accounting of retiring tags*
With trap-based exit-to-entry ratios creating lengthy waiting periods, it is critical to account fully for traps associated with a license when it is retired or not renewed. Since many fishermen scale down their operations in the several years proceeding their retirement, the number of tags associated with the license when they retire is often less than the number they fished historically. GMRI's analysis finds that if DMR calculated retired tags using the maximum number of tags

associated with a license rather than the number from its final year, 27% more tags would be retired, which would reduce waiting periods.

*System inadequate to respond to biological emergency*
The current system relies on strict conservation measures, such as setting minimum and maximum size and protecting egg-bearing females, as well as effort controls to conserve the resource, such as limits on licenses and traps. Despite a decline in the number of licenses overall (as envisioned when exit-to-entry ratios were introduced), the number of traps issued has climbed. In addition, fishing capacity has increased, through larger vessels and more vessels with additional crew, so more pounds are harvested from those traps. Thus, the current system does not control effort effectively. Fortunately, the resource has expanded, especially in Zones A, B, and C, and has accommodates the additional effort. However, if the resource were to decline, the current system would not be able to respond fast enough to prevent overfishing, which could be catastrophic to Maine's lobster industry and coastal communities.

### 2.4 Deficiencies identified through outreach efforts

*Unfairness of student license system*
A related complaint among those waiting to gain entry into the fishery is the provision that allows student license holders to enter the fishery without joining the waiting list if they complete their apprenticeship before they turn 18. This provision does allow qualified students to enter the fishery, but it does not lengthen the waiting period for others, since students are not subject to the exit-to-entry ratios. Between 2001 and 2011, a total of 847 new licenses have been issued. Of those, roughly half were issued to students. There is strong support for the student license program and the role it plays in communities. But the question remains: should students be allowed to enter without a waiting period?

*Existing fishermen are making more and more money*
There is a strong perception that current fishermen are keeping new entrants out of the fishery while they make more and more money. Certainly, the exit-to-entry ratios limit new entrants in all zones except Zone C. But GMRI's analysis does not indicate that licensed lobstermen are getting rich at the expense of those on the waiting list. Seventy-three percent of active lobstermen are averaging $38,000 a year or less from the fishery and 97% are averaging $68,000 or less. Only three percent of the active license holders are earning an average of $125,000 or more. Additionally, GMRI's analysis suggests that a large influx of new commercial license holders could decrease profitability for the industry overall. In zones where exploitation is at or very near maximum, new entrants would be harvesting lobster at the expense of existing lobstermen. Thus, new entrants would not yield additional economic gain. Not only would profits decline for existing lobstermen, but new entrants could not expect to earn the same as current participants. In zones where exploitation rates are not at maximum, the increased landings would drive down prices. Since information on exploitation rates is not definitive, however, it is impossible to predict accurately the impact of a large influx of new effort in the fishery, on either the resource, the profitability of existing fishermen, or the profitability of the new entrants.

## 3. Recommendations for addressing identified and perceived deficiencies:

*Deficiency: Latent Effort*
*Recommendation: Tiered Licensing System*

While it is critical to address the latent effort in the system, it is equally important to do so in a manner that does not undermine the expectations of those who hold unused licenses and trap tags or may be planning to build their business over time.

GMRI recommends the state consider instituting a tiered licensing system to reduce the uncertainty that latent effort represents and to minimize the potential for the situation to arise again. Properly designed, a tiered system would allow holders of latent licenses to retain their license and provide a pathway for them to enter the fishery in a measured fashion that would not dramatically increase overall effort.

Essentially, a tiered license system, as more fully detailed on page 69, would create four levels of commercial licenses, with increasing amounts of allowed traps. Existing license holders would be divided into the four tiers based on landings and tag history, reflecting their current and recent activity. Access to lower tiers would be open to all who have completed the Apprentice Program. But access to upper tiers would be limited by the exit-to-entry ratios, which could be set to one-to-one.

*Deficiency: Long Waiting Periods*
*Recommendations: Change trap tag accounting; Encourage zones to revisit exit-to-entry ratios; Tiered Licensing System*

Waiting periods are inevitable in any limited-entry system, but are causing tension and hindering the ability for families to pass down their businesses. One way to reduce waiting periods would be to change the way the number of retired traps are calculated. If the maximum number of tags a license had were retired rather than the license's number in its final year, on average 27% more traps would be counted as retiring, reducing waiting periods.

In the past, several zones have requested that the Commissioner relax their exit-to-entry ratios. Those requests have not been approved. DMR could work with the zone leadership to revisit those requests and consider these changes again.

Finally, a tiered licensing system, as proposed above and further detailed in this report, would reduce waiting periods by allowing more people in the lower tiers. Access to higher-trap tiers would continue to be restricted, but more people would have access to the supplemental income that many seek without dramatically increasing effort.

*Deficiency: System inadequate to respond to biological crisis*
*Recommendation: Develop Fishery Management Plan*

The lobster resource in Maine has been expanding over the past two decades. Favorable environmental conditions along with effective conservation measures have led to an ever-increasing abundance of lobsters recruiting to legal size. Under such conditions, or even during times of stable resource abundance, effort-control systems like those currently used in Maine are generally adequate to manage harvesting levels. If the resource were to decline dramatically, an event that could be triggered by environmental changes or disease, significant new restrictions on effort would be necessary. In order to prepare for such a situation, GMRI recommends that DMR work closely with the industry to develop a Fishery Management Plan that establishes clear goals for the fishery along with specific objectives that will help meet those goals.

In the meantime, every effort should be made to make future effort restrictions more manageable. That goal suggests keeping effort – the number of traps – at current levels. GMRI's recommendations to reduce latent effort and establish a tiered license system would achieve this goal.

Experiences from other trap fisheries worldwide offer another insight from which Maine should learn: in virtually all cases where the lobster resource declined significantly, attempts to curtail effort proved inadequate. In these cases, the fishery had to institute output control systems in the form of quotas. GMRI is not recommending that the State institute a quota system for its lobster fishery for a range of reasons, including lack of support for such a move within industry and the dramatic changes it would cause to the fishery and the communities and families that depend upon it. However, it would be prudent during this period of high abundance for the State and industry to plan collectively for changed circumstances. Contemplating how to set and allocate annual quotas may have to be part of that discussion.

## Project Introduction

This project was initiated by the 125th Maine State Legislature, which directed the Maine Department of Marine Resources (DMR) to contract for an independent evaluation of the existing limited entry licensing system in Maine's lobster and crab fishery (RESOLVE Chapter 62, LD 1532). The legislation was in response to criticism about the fairness of the existing licensing system from people who have experienced long waiting times to enter the fishery, particularly from adults and those that gave up their license earlier and want to re-enter the fishery. However, current license holders remain concerned about the existing effort in the fishery, profitability, and gear congestion. The Legislature specified in LD 1532 that the analysis must include an evaluation of the limited entry system, and determine whether its benefits, including for conservation, outweigh its costs, including the impact of restrictions on entry to the lobster fishing industry.

DMR subsequently awarded a contract to the Gulf of Maine Research Institute (GMRI) through a competitive bid process on July 10, 2012 to undertake the evaluation. DMR asked for both an objective and analytical evaluation of the current limited entry system as well as a range of recommendations for addressing any deficiencies identified in the current system.

This report is structured to address the key questions identified by DMR in their request for proposals. The first section (Objective I) provides an overview of the existing limited-entry program. The second section (Objective II) provides an analytical evaluation of the current limited entry system. Under Objective III, the report details lessons learned from other jurisdictions, which may be applicable to Maine's lobster fishery. Finally, the report concludes with options for consideration for the future management of Maine's lobster fishery and discussion of the potential impacts of these options (Objective IV).

GMRI has compiled existing data and produced new industry survey data in order to evaluate the impact of the current lobster license system on individual license holders, apprentices, and students, as well as coastal communities. In addition, public listening sessions and mixed stakeholder Working Group meetings were held during this period to illuminate further concerns from license holders and non-license holders, solicit suggestions for changes, and assimilate varying regional perspectives.

The following report provides an analysis of the current lobster and crab limited entry license system against a set of criteria defined by DMR. These criteria include:

- Impact on Maine's coastal economy;
- Efficacy of entry and exit;
- Effect of latency of licenses and tags;
- Ramifications of fisherman's age structure; and
- Utility of the system for conserving the lobster resource.

In addition to the evaluation of the current system, the report provides a range of options for consideration to address identified shortfalls, with associated pros and cons, and potential economic impacts to individuals and Maine communities. It is important to note that these are *a range of options* for revisions to the system that may be implemented over the next two to five

years, but will require further vetting by the State, industry, and interested public. GMRI presents a preferred option – establishing a tiered license system – as a path forward that addresses a range of issues. This recommendation is intended to provide structure for a coast-wide dialogue, as the details of designing and implementing such as system are critical to its acceptance and success.

## 4. Background

Maine's lobster fishery has seen two decades of increasing landings and enjoys a global reputation as a sophisticated culinary product that is sustainably harvested. According to the Atlantic States Marine Fisheries Commission's (ASMFC) most recent assessment, the stock is currently not overfished and overfishing is not occurring. Of the total American lobsters landed in the U.S., approximately 90 percent have historically been caught in Maine. But there is uncertainty about the future robustness of the stock and the economic value of the fishery. Managers are concerned about the threat of excessive effort and potential future recruitment failure. A new stock assessment is scheduled for 2013.

American lobster landings in Maine have increased dramatically in the last two decades, rising from an average of 20 million pounds from 1950 to early 1990, increasing to 50 million pounds in the end of 1990s, and then peaking in 2011 at 105 million pounds with a market value of $335 million (Figure 1). However, the CPI-adjusted ex-vessel price in 2011 (adjusted to the Consumer Price Index[1] based on 1982-84 dollar value) shown in Figure 1 is as low as it was in 1960.

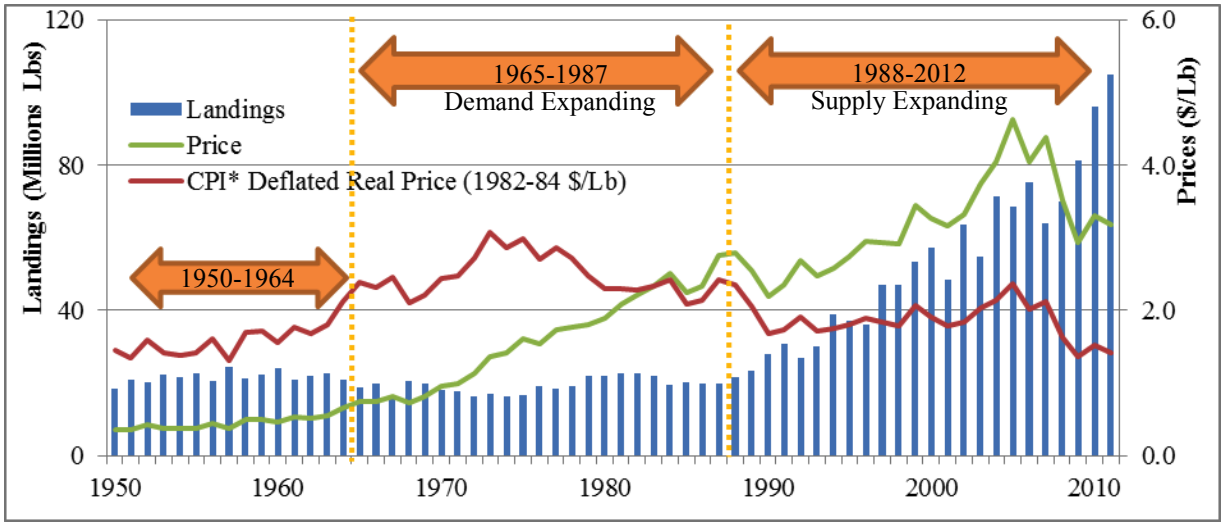



**Figure 1: Landings and Prices of American Lobsters in Maine (1950 – 2011)**

Figure 1 shows that from 1965 to 1975, CPI-deflated prices trended up while landings were limited to about 20 to 25 million pounds, comparable to landings in 1950 to 1964. During 1965 to 1987 there were signs of demand growing more than the supply. However, from 1988 to 2003, the CPI-deflated price trended downwards as landings expanded more than demand. Furthermore, the recent dramatic declines in ex-vessel prices after the 2008 economic slowdown further challenged

[1] Consumer Price Index (CPI) is extracted from U.S. Department of Labor's Bureau of Labor Statistics for all urban consumers in U.S. cities on all items in a given 1982-84 base year. The CPI deflated price is calculated by dividing the

the profitability of the industry with ever-increasing costs of bait and fuel. For example, the price of herring bait soared from $25 per barrel in 2000 to $150 per barrel in 2010, a 500% increase (Acheson and Acheson 2010). The price of diesel fuel increased from $1.50 per gallon in 2004 to as high as $4.70 per gallon in 2008 and is still about $4.00 per gallon in 2012 (U.S. Energy Information Administration). Thus, despite record high landings leading to record high revenue for the fishery, *the actual profitability of the fishery has decreased*.

Since the economic slowdown in 2008, the industry experienced a 33% deflation in price per pound with a 64% percent increase in landings, i.e., an increase of one percent of landings resulted in an average of 0.5% reduction in price. Since 2010, the landings increased by nine percent but the deflated price dropped by seven percent. It is clear that demand is currently growing less than the supply.

In addition, during the summer of 2012, record warm seawater temperatures resulted in soft-shelled lobsters coming on the market a month early, which glutted the market and sent prices into a free-fall. At one lobster cooperative in Stonington the price fell to $1.35 per pound, down from about $3.50 or $4.00 during the same month in 2011 (New York Times, July 28, 2012).

Within Maine, landings have shifted eastward, with Washington, Hancock, and Knox counties experiencing escalating landings since 2007 (Figure 2(a)). The prices in all of Maine's counties exhibited downward trends, with the prices in Washington, Hancock, and Knox counties showing the most dramatic declines after the economic slowdown of 2008 (Figure 2(b)).

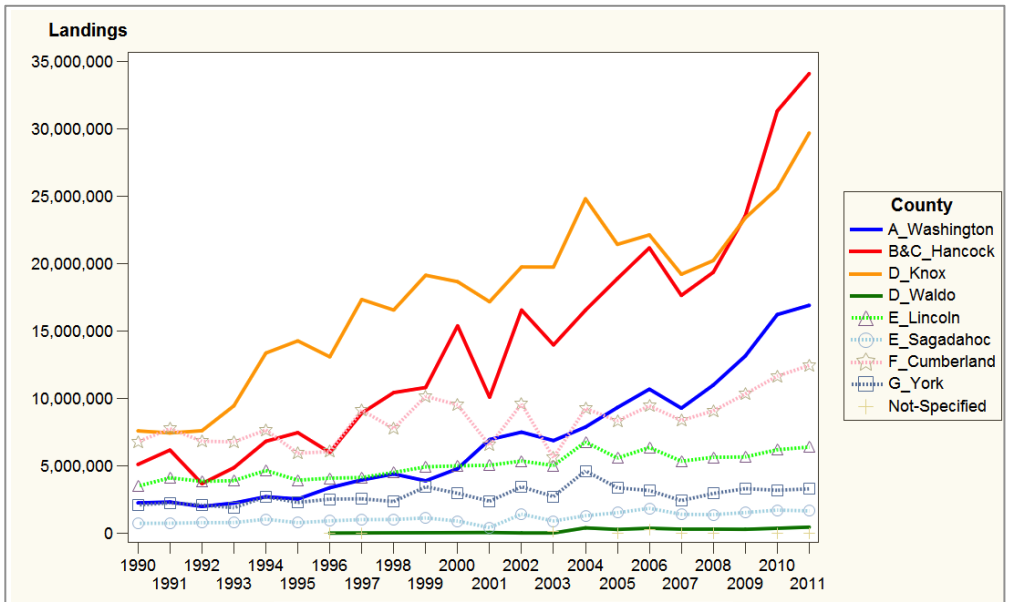



**Figure 2(a) Annual Lobster Landings by County**

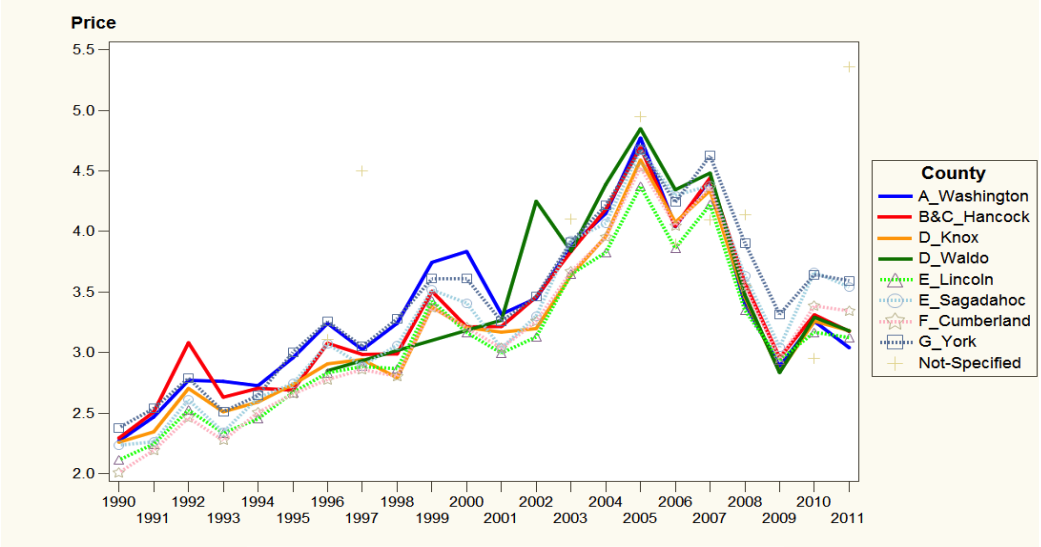
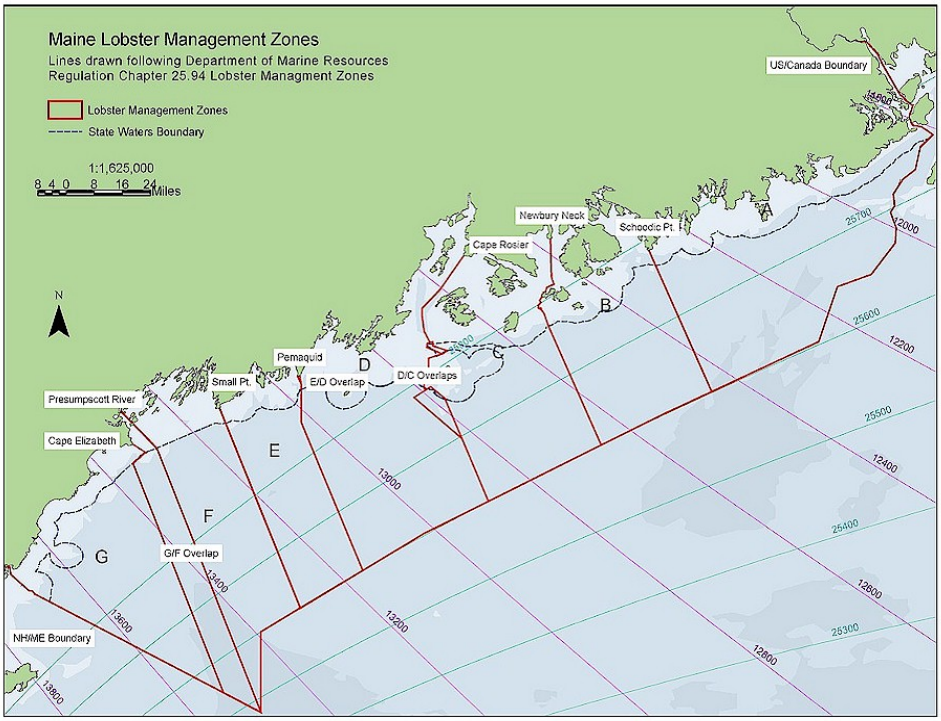



**Figure 2(b) Annual Lobster Average Prices by County**

Along with changes in the landings in the lobster fishery, the lobster management structure has also undergone dramatic changes since the mid-1990s (see Appendix I – Maine Lobster Laws 1996-2012). In response to concerns about escalating effort, territorial conflicts, and potential risk of resource collapse, DMR, the lobster industry, and the Legislature developed a formal management regime to institutionalize and preserve the traditional harbor-based nature of the fishery in 1995 (Acheson, et al., 2000). Maine established a zone management system that divides the coast up into seven geographically defined management zones (Figure 3) and moved some of the decision-making from the State to local Lobster Policy Management Councils (Zone Councils) (MRSA § 6446 and 6447).

The legislation originally gave the Zone Councils authority to vote on three management issues: 1) limits on number of traps per license and time for compliance, 2) number of traps on a trawl, and 3) time and days for fishing. In order to enact a change, a referendum is held among all commercial license holders in the zone, and the measure must be approved by a two-thirds majority vote before being sent to the Commissioner. If passed, the Commissioner has the authority and responsibility for determining if the management measure is "reasonable" before making it a regulation.

A trap tag system with an individual trap limit of 1,200 (with a build-down for those who were fishing more) was also enacted in 1995. Lobstermen were required to declare the zone in which they fish the majority of their traps and to purchase trap tags to identify their lobster traps. Under the Zone Council referendum, all zones now have an 800-trap limit except Zone E, which has gone to a 600 trap limit. In 2000, trap laws changed so that license holders may only purchase 100 more trap tags than they purchased the previous year to manage a gradual build-up to the trap limit. In addition, an owner-operator provision was put in place, requiring the owner of a fishing vessel to hold a lobster license and be on board the vessel when it is fishing for lobsters.




C. Rubicam, 8/9/02, DMR Maine Whale Plan

**Figure 3: Map showing Maine's Lobster Management Zones**

The 1995 legislation defined specific eligibility criteria to qualify for a commercial license (i.e., held a lobster license in the past, etc.). All Maine lobstermen were required to show DMR proof of eligibility to qualify for their 1996 lobster license. Each year since 1996, license holders must renew their license in order to guarantee future access (i.e., renew or lose).

The Legislature also instructed the Commissioner of DMR to establish a Lobster Apprentice Program to control future access into the lobster fishery. The Lobster Apprentice Program requires potential new lobstermen to document 1,000 hours and 200 days fishing over a minimum of two years with a sponsor before becoming eligible for a full commercial license. Subsequent regulations incorporated the requirement to pass a U.S. Coast Guard safety course.

Further constraints on entry beyond the Lobster Apprentice Program were implemented through the 1999 Limited Entry Law (MRSA § 6448). The Limited Entry Law gave Zone Councils the ability to recommend an entry-to-exit ratio (exit ratio) to the Commissioner of DMR for rulemaking through the Zone Council referendum voting process. Lobster zones may become "limited-entry zones" by recommending to the Commissioner an exit ratio whereby one new license is issued based on the number of trap tags retired the previous year (derived from licenses that are not renewed).[2] The regulations for limited entry established a floor for the reduction of licenses by 30% of 1997 levels, at which point entry-to-exit ratios would revert to 1:1. By 2001, all zones except A and C had established an exit ratio. In 2004, Zone A implemented an exit ratio and created a waiting list for entry. Most zones currently have a five-to-one license exit-to-entry ratio,

[2] The original legislation was based solely on number of licenses not renewed (and not trap tags). This was changed to trap tags in 2007 in an attempt to reflect effort being removed more accurately.

except for Zone A, which has a three-to-one ratio, which means 4,000 traps (five licenses x 800 trap tags) need to be retired before a new license is issued. These exit ratios have lead to a 12% reduction in licenses since 1997.

To fish in a limited-entry zone, a lobsterman must either:

- Have held a Class I, II, or III license in that zone the previous year;
- Be eligible for a Class I, II, or III license and be under 18 or over 70;
- Be authorized as a "new zone entrant" off the waiting list; or
- Be granted a medical or military waiver by the Commissioner.

If a license holder wants to change zones, he or she needs to get on the waiting list for the new zone.

Zone C has not restricted entry through the limited entry law. Instead, the Zone C Council developed a pilot program to enhance the Apprentice Program. In 2001, Zone C was given the authority by the Legislature to propose rules to increase the minimum number of years required for apprentice to complete the program, require a sponsor of apprentice to have held a license for at least five years, and limit entry to persons who have apprenticed in the zone. Since 2005, all seven zones have been granted the same authority and have made adjustments to their apprentice program within their zones accordingly.

In an effort to maintain an opportunity for younger fishermen to continue to gain access to the lobster fishery, the 1999 Limited Entry Law included a highly significant exemption to the exit ratio (and resulting waiting lists). A student license holder may enter the Apprentice Program while fishing with a student license. If a student license holder completes the requirements of the Apprentice Program *before turning 18*, he or she is eligible to enter a limited-entry zone without going on the waiting list. Their entry into the zone is *not* dependent on retiring trap tags and therefore not considered when the number of new entrants from the waiting list is established for that year (i.e., it is not counted against those on the waiting list).

## 5. Data Analysis and Evaluation Methods

Evaluating the current commercial lobster licensing system required information from a variety of existing and newly generated sources. GMRI drew upon existing external reports, including:

- DMR's 2008 Lobster Effort Survey;
- Results of the 2009 Economic Sustainability Task Force;
- Report to the Legislature Regarding Limited Entry; and
- 2008 Memoranda and Reports from the Lobster Advisory Council, associated with a tiered licensing proposal.

GMRI also drew on more recent internal work including the 2011 Lobster Business Profitability Study (Dayton, A. 2012) and a Lobster Business Simulator developed in 2012.

Several data sources were used in the analysis to provide a thorough evaluation:

- DMR Lobster License Database for years 1996 – 2012 (Marine Resources Licensing and Enforcement Database – MRLEN);
- DMR Dealer Reports for 2011 (Commercial Fisheries Dealer Electronic Reporting Database – CFDER);
- DMR Current and Historical Lobster License Waiting Lists; and
- National Marine Fisheries Service (NMFS) Federal Lobster Dealer Data.

In order to prepare the data for analysis, GMRI completed a thorough process of merging DMR's licensing and trap tag data with DMR's dealer reports. Given the complexities of the trap tag system, there were a series of trap tag distribution issues that required close attention and consideration. For example, license holders may be issued additional trap tags if they fish with the same trap in two zones, or the same trap may have two tags if there are two license holders who wish to haul those traps, such as a father-son operation. The status of the license holder and the trap tags associated with that license number (i.e., excluding "double tags", "second tags", "retired license", "suspended license" and "unregistered tags") were addressed appropriately and excluded from the analysis. Finally, federal dealer data from the National Marine Fisheries Service was used to link the data for value and pounds landed of lobster by trip for all lobster vessels in Maine who also hold a federal license to fish beyond the state's three-mile territorial limit.

It is important to note that the State uses several categories of licenses to classify lobster fishermen in Maine. Commercial lobster licenses are divided into three classes, and there are three additional lobster license categories as defined below:

- Class I (LC1) allows no additional crew;
- Class II (LC2) allows one additional crew member;
- Class III (LC3), allows two additional crew;
- Student Licenses (LCS);
- Apprentice Licenses (LA); and
- Non-Commercial Licenses (LNC).

Throughout this report, the term "Commercial Licenses" refers to all class of commercial licenses (i.e., LC1, LC2, and LC3). Throughout the analysis, the term "All Licenses" includes all Commercial, Student and Apprentices Licenses. Non-Commercial Licenses (i.e. recreational) are NOT included in this term.

In addition to the pre-existing datasets, GMRI commissioned two independent surveys to solicit feedback and opinions: one survey mailed to all current commercial license holders ("2012 License Holders Survey"), and a second to individuals on the waiting list, in the Apprentice Program, and Student License holders ("2012 Non-License Holders Survey"). The survey had the added benefit of advertising the project and increasing awareness. The survey focused on simple measurable questions, and featured a short series of multiple-choice responses to ensure accuracy of data processing and a standard method for reporting results. Samples of the survey, full methodology, and the complete analyzed responses are in Appendices D & E.

Of the 6,767 total surveys mailed, 1,730 surveys were completed and returned for a robust overall 26% response rate. Within this, a total of 1,417 of the 2012 License Holders Surveys were returned (27% response rate) and 313 of the 2012 Non-License Holders Surveys were returned (20% response rate). An independent third-party, Market Decisions, Inc., conducted the survey and processed the responses. To maintain the privacy of the responders, Market Decisions tagged each survey with an anonymous identification to link the answers to various data sources.

GMRI employed a broad outreach strategy with a mix of individual phone and in-person communications and public listening sessions in each zone (see Appendix H for details and results). In addition, we convened a Working Group of industry stakeholders, academics, and non-profit representatives that work with the lobster industry. This group met twice to provide insight into the results of the survey and GMRI's analysis.

Through this outreach we gathered perceptions from the Maine lobster fishing community of the key attributes of the existing system and potential options for enhancing it. We collected input from lobstermen to understand what they value in the existing limited entry system, their communities' core values, and insights related to goals for the fishery. We considered cultural and community heritage, specific individual profitability goals, sacrifices made thus far by various segments of the community, and fears about the future. We also gained insight into what communities consider a fair lobster licensing system.

# Objective I: Overview of the Current Lobster Licensing Information

**Key Findings**:

Increase in Capitalization: From 1997 to 2011, the number of fishing licenses decreased statewide by 12%, while tags issued increased statewide by 13%. Regionally, the number of tags issued decreased in Zones D, E, F & G, and increased in Zones A, B, & C. Increases in the number of LC3 licenses, the number of fishermen who also hold a Federal permit, and the number of larger vessels in the fleet all suggest that the fishery is becoming more heavily capitalized, which may be increasing fishing pressure, particularly in the Downeast regions and offshore. There has been a corresponding decrease in the number of smaller boats in the fleet. Single-lobsterman operations have also declined.

Decrease in Apprentice Program Participation: Enrollment in the Apprentice Program has declined over this period, most notably beginning in 2008. Zone C, which does not limit entry, is the exception and has maintained a steady number of Apprentice Program participants over the years. Evidence from our outreach and the unique situation in Zone C suggest that long waiting times to receive a commercial license are suppressing participation in the Apprentice Program. Given the goal of the limited entry system to reduce the number of license holders, this is an expected outcome and may imply that only the most committed aspiring lobstermen are pursing an apprenticeship.

## 1. Composition of Licenses, Tags, Federal Permits, and Vessels Statewide:

### *1.1 Number of Licenses by License Status and License Type*

As we see in Table 1, during the period from 1997 until 2011, the total number of existing (excluding retired and suspended) licenses declined from 7,090 to 6,234 or a 12% decrease. During this same time period, the total number of initial tags issued increased by 13% from 2,587,175 to 2,925,626, suggesting that there are fewer license holders who have more trap tags per individual. In addition to the observed decrease in the total number of license holders, the proportion of existing license holders relative to newly admitted license holders has increased each year since 1996.

As we see in Figure 4, the percentage of total new licenses issued each year decreased from seven percent of the total licenses issued in 2000 to less than two percent of the total licenses issued in 2011. In addition to changes in the total numbers, more new licenses were issued to individuals under 18, and we see a significant change in the composition of the license types since 1997. As shown in Figure 5 (a), there has been an increase in the number of LC3 licenses and a decline in the number of LC1 licenses.

Figure 5 (b) shows that license holder exit rates for this same period have been between two percent and four percent per year. This is further discussed in Objective II of the report.

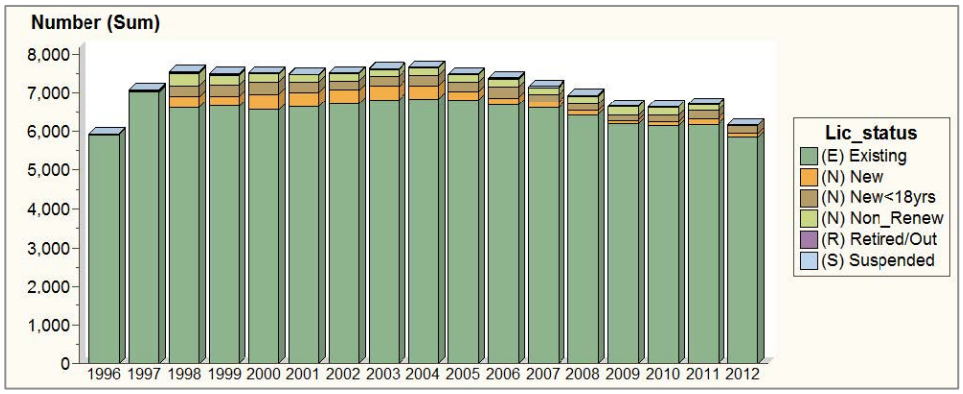



**Figure 4: Number of Commercial Licenses by License Status, for all Zones from 1996 to 2011**

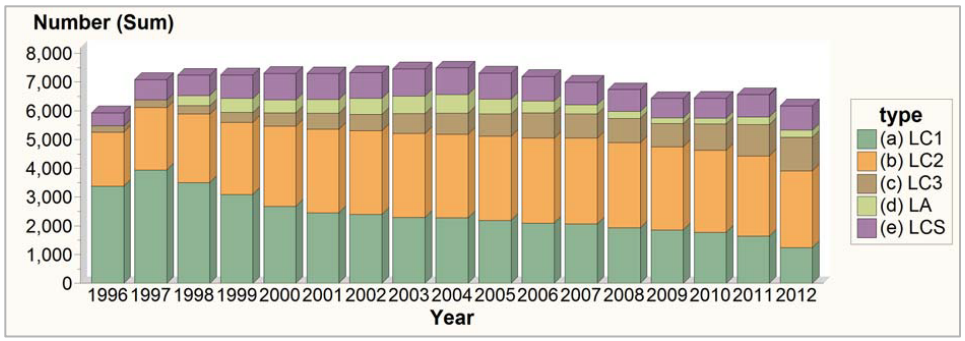



**Figure 5 (a): Number of Commercial Licenses by License Type, for all Zones from 1996 to 2011**

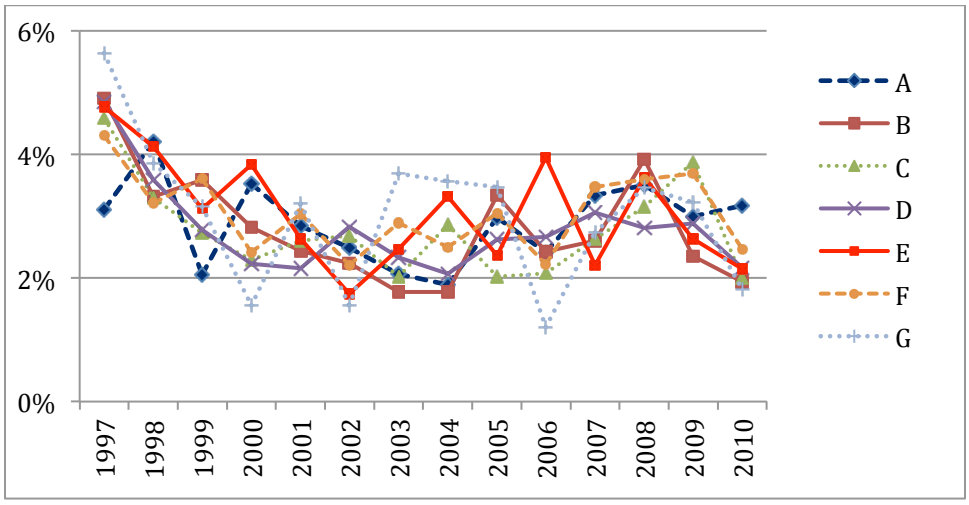



**Figure 5 (b): Percent of Non-renewed Commercial Licenses, for all Zones from 1996 to 2011**

### *1.2 Number of Student and Apprentice Licenses*

The number of Student (LCS) Licenses issued has varied slightly over the years but generally averaged around 750. Because of the overall decline in license holders, the LCS proportion of the whole has increased. More detail regarding the Student Program is found in Objective II.

The total number of Apprentice (LA) Licenses issued per year increased annually over the period 1998 to 2004, with a maximum of 609, and then began a gradual annual decline. In 2011, a total of 275 LA licenses were issued (see Figure 22), 296 people over the age of 18 are on the waiting list (see Table 5) after completing the requirements of the Apprentice Program or Students program. A detailed discussion by Zone follows in Objective II.

### *1.3 Number of Trap Tags Statewide*

The change in the distribution of tags issued to each license type follows the change in the composition of the license holders. As seen in Figure 6(a), the number of tags issued to the LC3 license category has increased and the number of tags issued to the LC1 licenses has decreased. The number of tags issued to LCS license holders and LC2 license holders has remained relatively constant over the years.

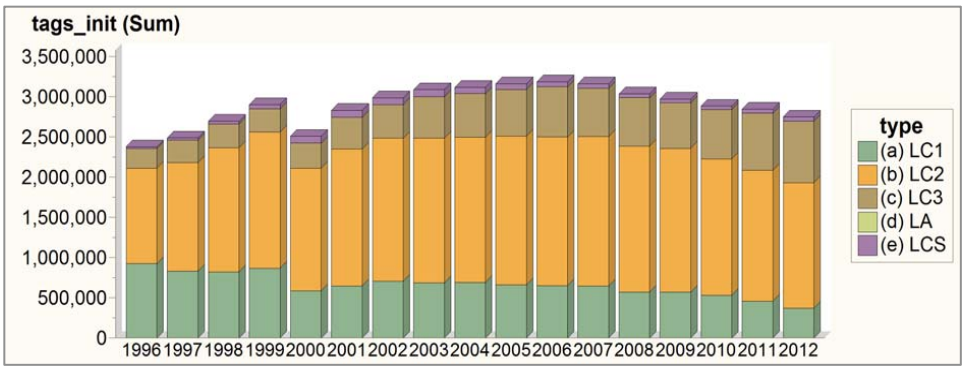



**Figure 6 (a): Number of Tags Issued by License Type, for all Zones from 1996 to 2011**

Figure 6 (b) below shows the state-wide average number of trap tags issued per LC1, LC2, LC3 and LCS license is about 240, 580, 699, and 53, respectively.

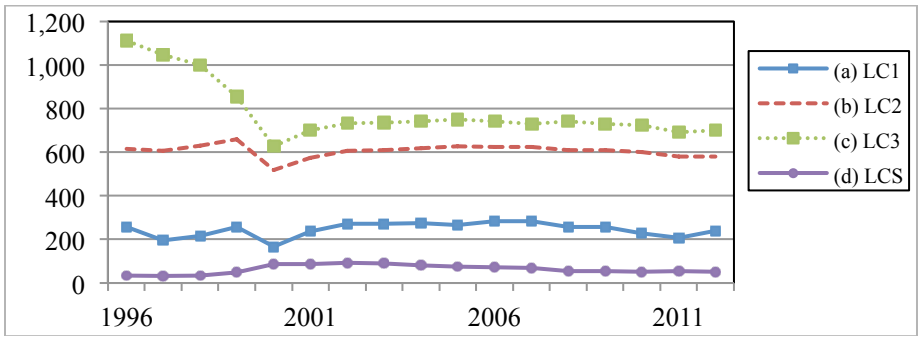



**Figure 6 (b): Average Number of Tags Issued per License Holder by License Type**

### *1.4 Number of Federal Permits*

Fishermen who hold a State lobster license may also hold a Federal lobster permit. Figure 7 (a) shows that the decrease in overall number of licenses is largely felt in the number of license holders who do not hold a Federal permit. Therefore, we see that the number of license holders who also hold a Federal permit has increased as a proportion of the total.

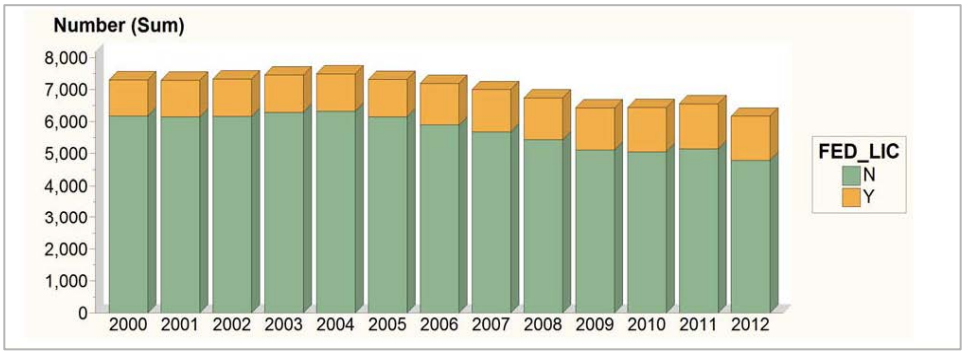



**Figure 7 (a): Number of Commercial State License Holders who also hold a Federal Permit, by License Type, for all Zones, for years 2000 to 2012**

As seen in Figure 7 (b), the group of lobstermen who also hold a federal lobster permit has increased each year, resulting in a 27% overall increase since 1999. This increase falls mostly in the LC3 category, suggesting that more Maine lobstermen may be fishing in federal waters, in addition to state waters.

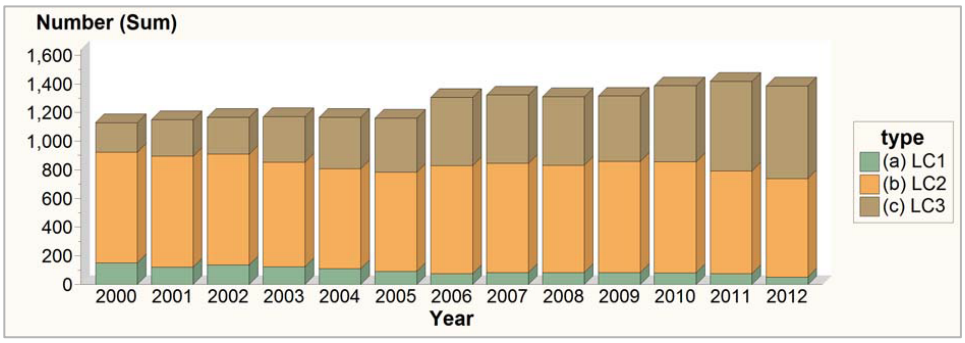



**Figure 7 (b): Number of Commercial State License Holders who also hold a Federal Permit, by License Type, for all Zones, for years 2000 to 2012**

As seen in Figure 7 (c), the number of State license holders who do *not* hold a Federal permit initially increased during the years 1996 to 1999, but then sharply decreased between 1999 and 2000, most notably in the LC1 category. This was likely associated with new owner-operator provisions enacted, or the new exit ratio process established in 1999, which may have changed the State permit eligibility for certain Federal fishing operations (see Appendix I). The total number of State license holders who do not hold a Federal permit has continued to decline gradually since 2000, resulting in an overall 32% decrease since 1999.

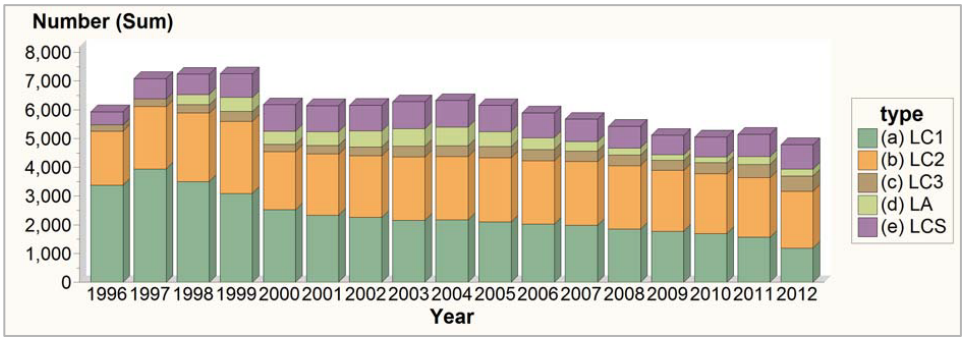



**Figure 7 (c): Number of Commercial State License Holders who do not hold a Federal Permit, by License Type, for all Zones, for years 1996 to 2011**

Maine lobster landings totaled just over $335 million in 2011, with more than 50% caught by license holders who also hold a federal permit, as shown in Figure 7 (d) below. Figure 7 (e) shows that the majority of the landings were reported by LC2 and LC3 license holders and that LC1 and LCS license holders account for a small proportion of the total landings. Zone C accounted for more that 28% of Maine's total lobster landings in 2011 while Zones A and D each account for 19% of the total landings.

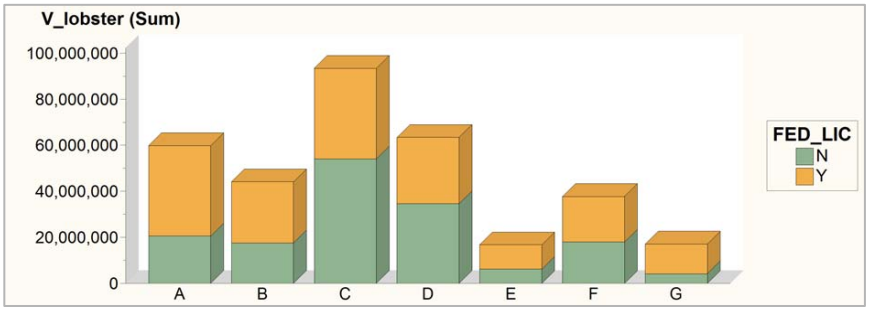



**Figure 7 (d): Maine 2011 Lobster Landings Values, State vs. Federal, By Zone**

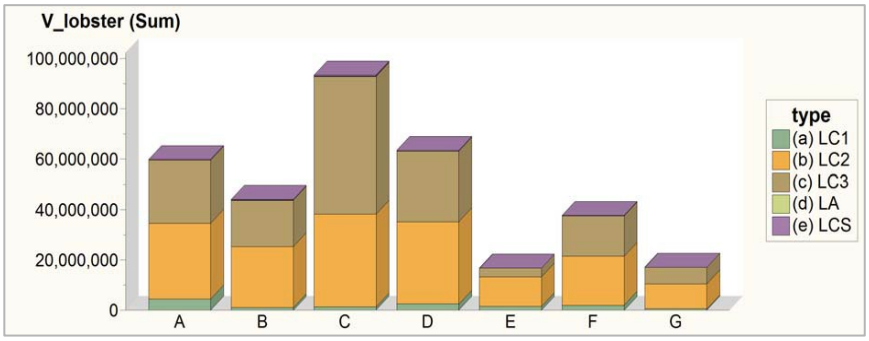



**Figure 7 (e): Maine 2011 Lobster Landings Values, by License Type, By Zone**

### *1.5 Distribution of Vessel Length*

Figure 8 (a) shows a 52% decline in the number of vessels under 20 feet since 1996, and Figure 8 (d) shows a 180% increase in vessels over 40 feet during that same period. The number of vessels under 20 feet dropped from 40% of the total in 1996 to 20% of the total in 2012. Meanwhile, as we see in Figure 8 (d), the number of vessels greater than 40 feet rose from four percent of the total in 1997 to 11% of the total in 2011. The number of mid-size vessels, as seen in Figure 8 (b) and Figure 8 (c), has remained relatively constant over time. Overall, there has been fleet-wide trend towards larger vessels.

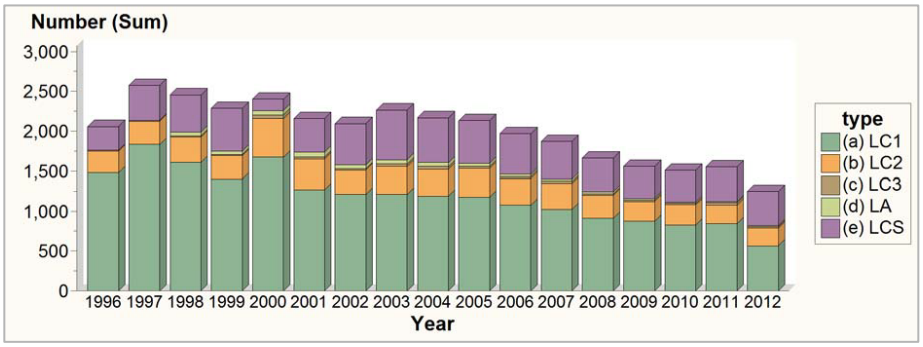



**Figure 8 (a): Number of Vessels, Length=(a) <20'**

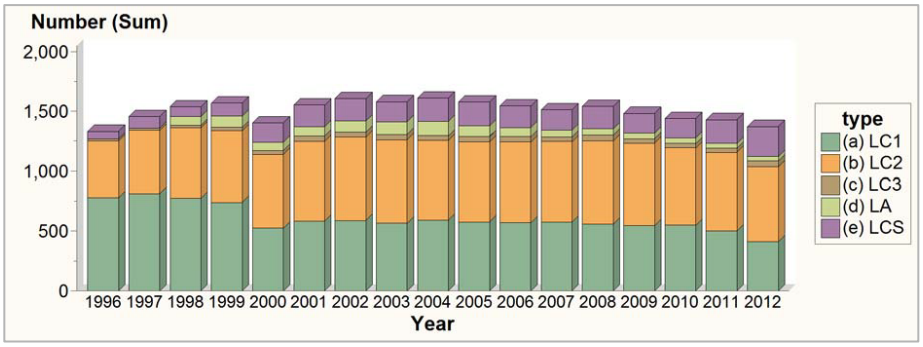



**Figure 8 (b): Number of Vessels, Vessel_Length=(b) 20'-30'**

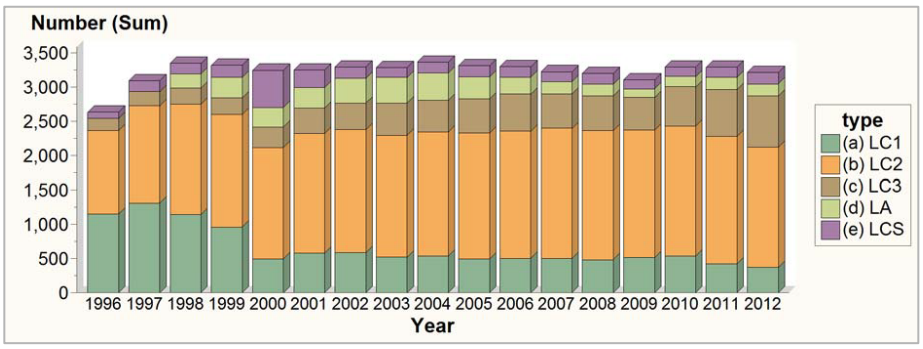



**Figure 8 (c): Number of Vessels, Vessel_Length=(c) 30'-40'**

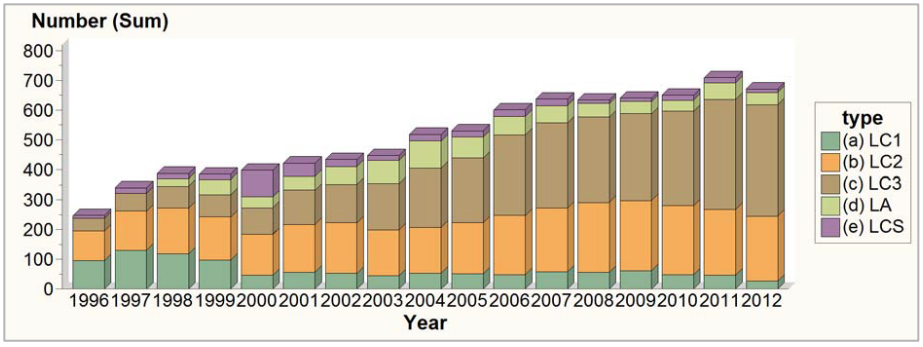



**Figure 8 (d): Number of Vessels, Vessel_Length=(d) >40'**

## 2. Licenses and Tags by Zone:

### *2.1 Number of Licenses and Tags*

Examining the data by zone yields important insights into regional differences. These zones are established according to the Zone Boundary Map (Figure 3).

As we see below in Table 1, the number of licenses issued decreased from 1997 to 2011 in Zones B, D, E, F, and G. Zones D, E, F, and G experienced the greatest declines, accounting for a significant proportion of the statewide decline. Zones A and C have seen increases in the number of license holders.

**Table 1: Number of All Commercial, Student and Apprentices Licenses and Number of Trap Tags in 1997 and 2011**

| | 1997 Licenses | 2011 Licenses | % Change | 1997 Tags | 2011 Tags | % Change |
|---|---|---|---|---|---|---|
| Zone A | 1127 | 1231 | 9% | 380,189 | 620,181 | 63% |
| Zone B | 693 | 632 | -9% | 236,634 | 304,133 | 29% |
| Zone C | 1091 | 1115 | 2% | 423,524 | 538,000 | 27% |
| Zone D | 1485 | 1201 | -19% | 616,836 | 608,225 | -1% |
| Zone E | 714 | 548 | -23% | 210,702 | 203,648 | -3% |
| Zone F | 1374 | 1028 | -25% | 509,332 | 446,350 | -12% |
| Zone G | 605 | 479 | -21% | 209,958 | 205,089 | -2% |
| All Zones | 7,090 | 6,234 | -12% | 2,587,175 | 2,925,626 | 13% |

As we see below in Table 1(a), the total number of all LC1, LC2, and LC3 licenses issued, excluding Students and Apprentices (as they did not exist in 1997), decreased between the years 1997 and 2011 across All Zones, and decreased by an average of 23% overall. Zones D, E, F, and G experienced the greatest declines, accounting for a significant proportion of the statewide decline; Zones A and C have also show declines, suggesting that their increases in license numbers observed above in Table 1 are reflective of new entry through the Student and Apprentice licenses.

As previously mentioned, the regulations for limited entry established a floor for the reduction of licenses by 30% of 1997 levels, at which point entry-to-exit ratios would revert to 1:1. The original legislation was based solely on number of licenses not renewed (and not trap tags). This was changed to trap tags in 2007 in an attempt to reflect effort being removed more accurately. Relative to these reduction targets, Zones E, F, and G have indeed achieved the 30% reductions in licenses, but trap tags issued in Zones E. F & G have decreased at a much slower rate than license numbers, ranging between 3% and 13%, and therefore have not yet reached the targets set forth in 1997.

**Table 1 (a): Number of All Commercial (LC1, LC2, LC3) Licenses and Number of Trap Tags in 1997 and 2011**

| | 1997 Licenses | 2011 Licenses | % Change | 1997 Tags | 2011 Tags | % Change |
|---|---|---|---|---|---|---|
| Zone A | 1,036 | 978 | -6% | 376,124 | 610,556 | 62% |
| Zone B | 641 | 493 | -23% | 234,697 | 296,686 | 26% |
| Zone C | 967 | 841 | -13% | 418,325 | 527,855 | 26% |
| Zone D | 1,316 | 971 | -26% | 608,486 | 600,544 | -1% |
| Zone E | 640 | 446 | -30% | 207,875 | 200,183 | -4% |
| Zone F | 1,223 | 809 | -34% | 503,360 | 438,595 | -13% |
| Zone G | 557 | 395 | -29% | 207,414 | 201,969 | -3% |
| All Zones | 6,380 | 4,933 | -23% | 2,556,281 | 2,876,388 | 13% |

The number of commercial licenses issued by zone from 1997 to 2011 reveals differences in Zones A, B and C relative to other zones (Figure 9(a)), each of which have admitted more entrants per year on average than the other zones. In addition, we observe that Zone C continues to see increases in the number of Apprentices, where the other zones have observed continued declines, particularly since 2008.

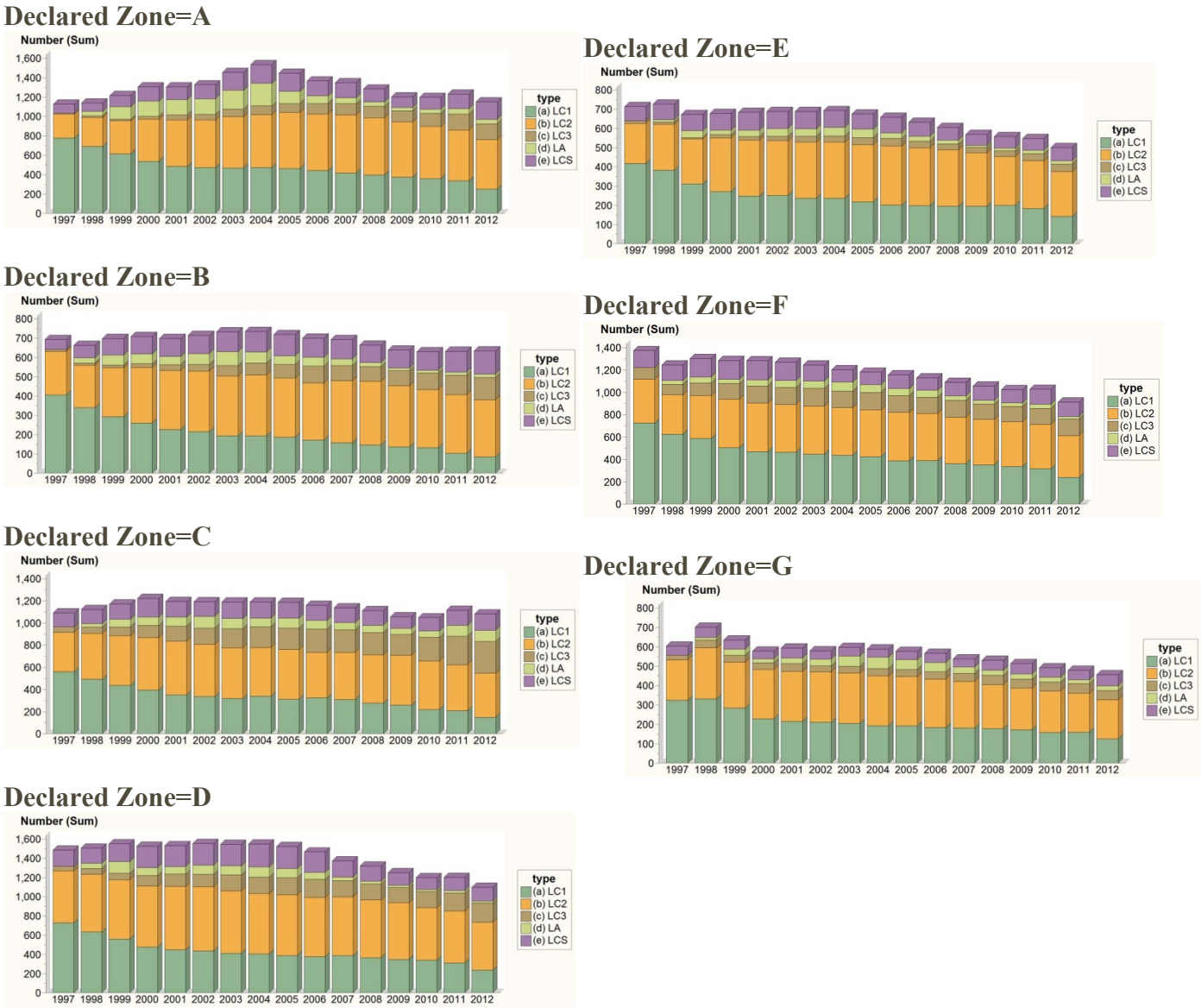



**Figure 9 (a): Number of Lobster Licenses Issued by Declared Zones from 1996 to 2011**

In Zones A, B, and C, the number of trap tags issued in 2011 increased (Fig. 9 (b)), relative to 1997 levels, with Zone A showing the largest increase at 63%. Zones D, E, F, and G have all experienced decreases in the number of trap tags issued.

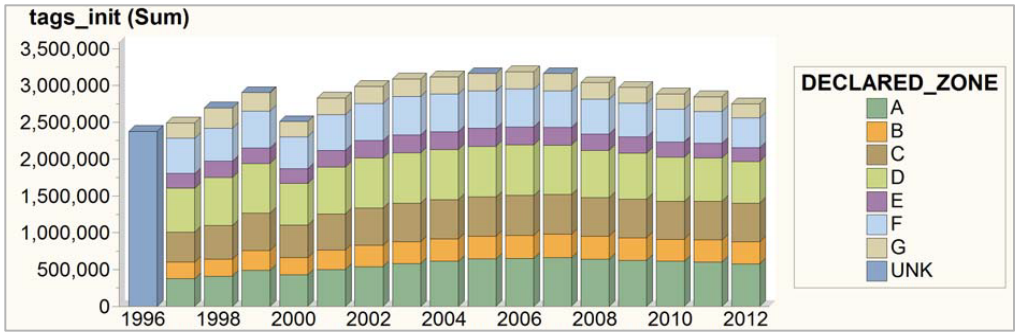



**Figure 9 (b): Number of Initial Tags Issued by Declared Zones from 1996 to 2011**

## *2.2 Average Number of Trap Tags per License by Zone*

Figure 9 (c) shows the average number of trap tags issued per license in each zone for the period 1997 to 2011. Aside from a sharp downturn during the implementation of trap limits in 1998 to 2000, the number of trap tags per license increased for all zones. The average increase over the full period was 161 trap tags per license. Zone A had the largest change with an increase of 169 trap tags per license, a 38% increase. Zone E had the smallest change, increasing by 60 trap tags per license or 15%. Zone E is also the only zone with a trap limit of 600 instead of 800. The maximum current average number of trap tags per license is 550, as observed in Zones A, C, and D. The minimum average number of trap tags per license of 400 is observed in Zone E. LCS License holder's average number of trap tags issued increased over the period 1997 to 2002, to a high of 100 trap tags on average per license holder, and has since then gradually declined and stabilized at an average of 50 trap tags per person.

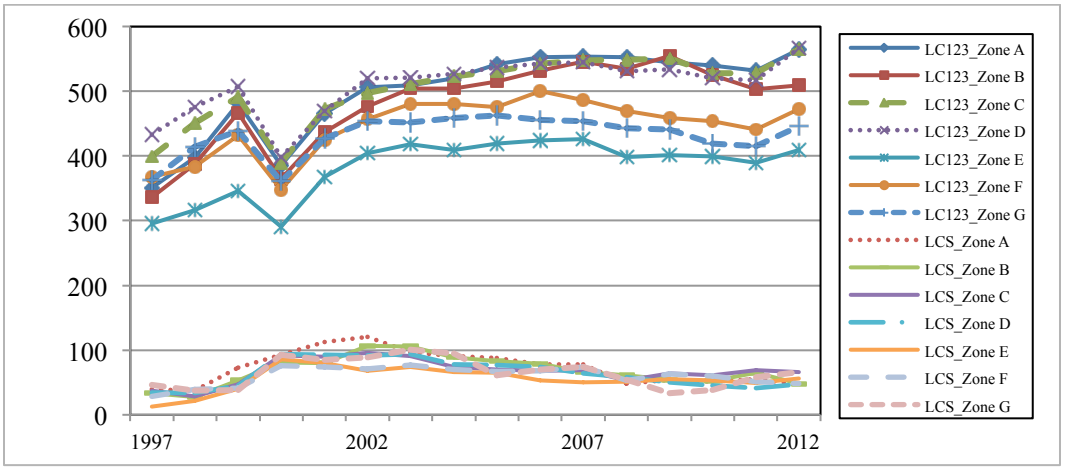



**Figure 9 (c): Average Number of Tags Issued per License Holder, by Zone**

## Objective II: Evaluation and Analysis of the Current Limited Entry System

GMRI has been asked to provide an independent analysis of the strengths and weaknesses of the existing limited entry system and develop recommendations for changes to address any deficiencies identified in the evaluation. The survey administered as a part of this project is referenced throughout our findings below.

### 1. Economic Performance of the Lobster Fishery and Its Impact on the State Economy

**Key Findings**:

Lobster landings have increased significantly since 1997, but the market has not absorbed the expanded supply since 2004, resulting in lower price per pound. Without changes in the overall market demand for lobster, it is expected that any further expansion of the supply, especially in the second quarter (April – June), is likely to result in further price deflation, and have a further negative effect on individual profitability.

The profit margin associated with lobstering is relatively low, with the exception of large operations landing more than 90,000 lbs. per year, which benefit from efficiencies due to scale. Increases in operating costs, coupled with deflated landed price, have caused lobstermen to increase their annual catch further as a means of maintaining a certain level of operating income. This has a further negative effect on the market price and places additional fishing pressure on the resource.

There are significant regional differences in license holders' dependency on the lobster resource as a proportion of household earnings. Zones A, B, C & D show the highest household dependency, and Zones E, F & G show less dependency. Zones A, B & C have fewer employment opportunities than other regions, and also show the highest recent catch rates. The potential cannibalization effects of new entry may be overshadowed by other different overall economic and social considerations, and efforts to shift the timing of harvest to avoid further market impacts may be productive for these regions.

The cost of excluding individuals from the fishery varies widely and cannot be estimated effectively, given the uncertainly associated with the market and resource exploitation rates. Economic impacts and profitability scenarios can be modeled using tools available, but the underlying assumptions must be developed in collaboration with industry and at the regional level.

The limited entry system provides a mechanism for allowing new entry of fishermen at a measured pace so as to ensure overall resource sustainability, market health, and individual and regional profitability. The overall seafood market in which lobster competes needs to be

evaluated to understand the economic impacts of changes in the supply of lobster, which might follow changes in licensing.

### 1.1 Overview of the Lobster Market

Figure 10 shows the monthly landings and exports of lobsters since the implementation of limited entry in Maine in 1997. It is apparent that a high percentage of lobster harvested in Maine is exported. Exports as a proportion of landings peaked in 2003, when over 85% of total landings were exported from 2002 to 2004, and have since declined. The export market did not absorb the expanded supply after 2004. Overall demand did not keep up with supply, lowering the price.

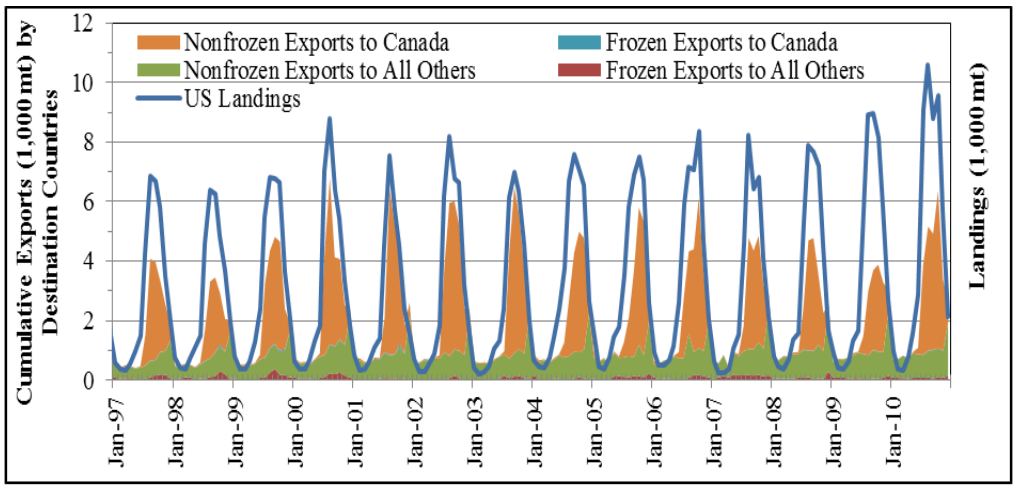



**Figure 10: Monthly US American Lobster Landings and Exports by Country and Product Type (frozen, fresh)**

Canada is by far the largest importer of U.S. lobster, accounting for 56% of U.S. exports from 1997-2010. Exports from Maine to Canada are highly seasonal and typically increase sharply in Spring, peak in late Summer, and drop off again in late Fall. This pattern matches the seasonality of U.S. landings and lobster fishing effort (trap hauls per calendar quarter) as shown in Table 2 and Table 3.

**Table 2: Average Trap hauls per vessel, by quarter, by zone (ref. 2011 Socio-Economic Study)**

| | Zone A | Zone B | Zone C | Zone D | Zone E | Zone F | Zone G |
|---|---|---|---|---|---|---|---|
| Quarter 1 | 261 | 255 | 257 | 265 | 190 | 304 | 241 |
| Quarter 2 | 569 | 530 | 578 | 553 | 390 | 554 | 546 |
| Quarter 3 | 255 | 237 | 223 | 232 | 174 | 263 | 222 |
| Quarter 4 | 254 | 237 | 225 | 233 | 182 | 256 | 236 |

**Table 3: Percentage of Fisherman who fished during each quarter, by zone (ref. 2011 Socio-Economic Study)**

| | Zone A | Zone B | Zone C | Zone D | Zone E | Zone F | Zone G |
|---|---|---|---|---|---|---|---|
| Quarter 1 | 24% | 37% | 21% | 23% | 31% | 23% | 45% |
| Quarter 2 | 74% | 85% | 81% | 81% | 85% | 76% | 94% |
| Quarter 3 | 92% | 98% | 100% | 97% | 100% | 99% | 98% |
| Quarter 4 | 88% | 91% | 89% | 93% | 84% | 87% | 91% |

In Figure 11 each dot indicates the equilibrium CPI-deflated ex-vessel price and landings when the demand meets the supply in each year. The inverse relationship between landings in Maine and price can clearly be seen during each period. It can be expected that any further expansion of supply would drive the equilibrium point further to the lower right in Figure 11, suggesting that *any increase in lobster landings, especially in the second quarter (April – June), are likely to result in further price deflation, because supply would exceed demand.*

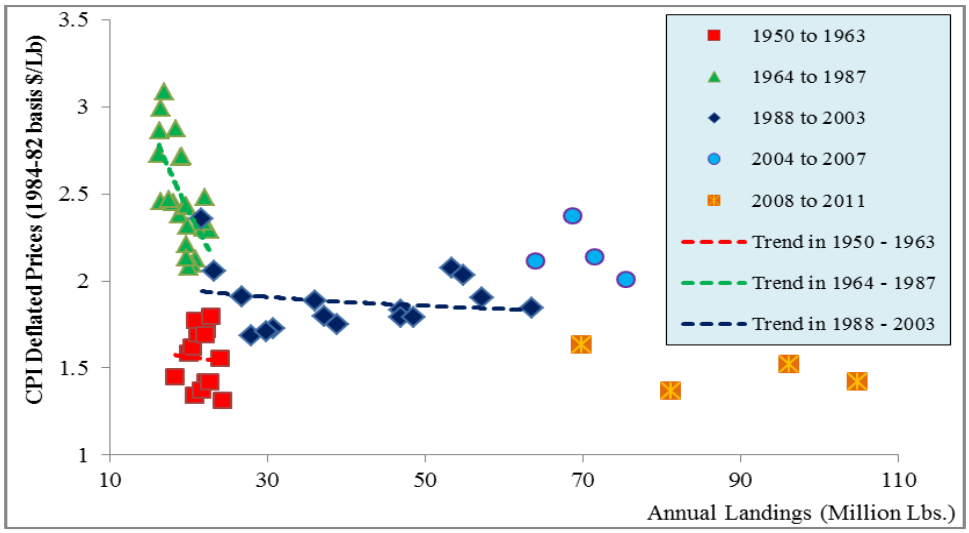



**Figure 11: Scatter Plot of Average Annual Prices and Landings of Lobster in Maine for Years 1950 - 2011**

The Moseley Group (2009) reports the Maine lobster industry is facing two major challenges that hurt overall profitability in a highly competitive worldwide marketplace. The first is extraordinarily strong "buyer power" as all players struggle to sell the same undifferentiated and commoditized product, and maximize revenue through volume. The second challenge is the threat of substitution as lesser-priced proteins gain favor on the dinner plates of consumers struck by today's difficult economic environment. A strong rivalry among various lobster industry constituents further confounds efforts to address market challenges to the industry. The Moseley report recommends several reforms and marketing strategies to enhance the industry's profitability potential.

### *1.2 Regional Economic Dependency on Lobster Fishery*

The regional dependency of commercial license holders on the fishery was examined based on household incomes derived from the fishery.

According to census data, Hancock, Waldo, and Washington counties have the highest unemployment rates along Maine's coast. Washington County has had the highest recent unemployment rates – typically two to four percentage points higher than the next highest county. All coastal counties in Maine experienced a general aging trend in the unemployed population from 2000 to 2010. In particular, a large cohort in their 30s and 40s aged into their 40s and 50s.

The reported dependency of household income for lobster fishermen from the lobster fishery varies by region. It is highest in the Zone C at 81% and Zone A at 77% and lowest in Zones E and F at 61%. Zones A, B, and C have few other economic opportunities, and the wage earning potential outside of lobstering is low. Compared to a similar study in 2005, dependency on the fishery increased across all regions as other job opportunities decreased (Dayton, 2012).

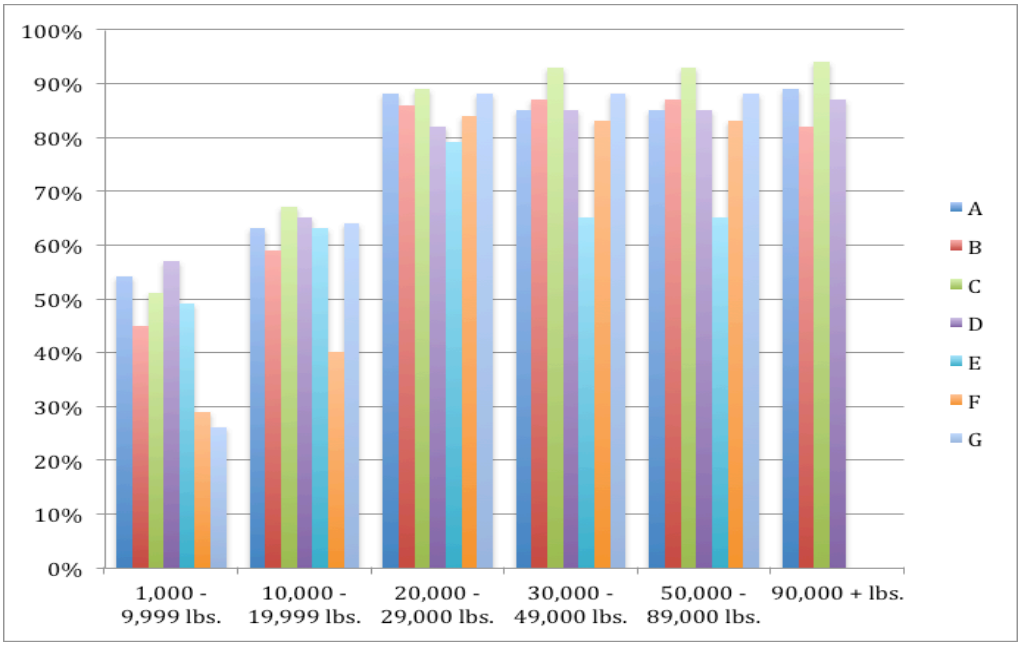



**Figure 12: Reported household income dependency on the lobster fishery, by Zone, by size of fishing operation as measured in annual pounds landed**

The reported dependency of household income derived from the lobster fishery varies significantly by fishing operation size and varies somewhat by zone (Fig. 12). Larger scale fishing operations (those landing 40,000 pounds and up) report an average 90% household income dependency. Smaller scale operations (10,000 to 30,000 pounds annual catch) range from 26% to 45% dependency (Dayton, 2012).

### *1.3 Individual Profitability Considerations:*

Lobster fishing profitability in all regions is correlated with annual catch (Figure 13). Fishermen who land the most pounds per year have the highest gross revenue and also the highest net individual operating income, which is defined as revenue minus operating expense. (Dayton, 2012).

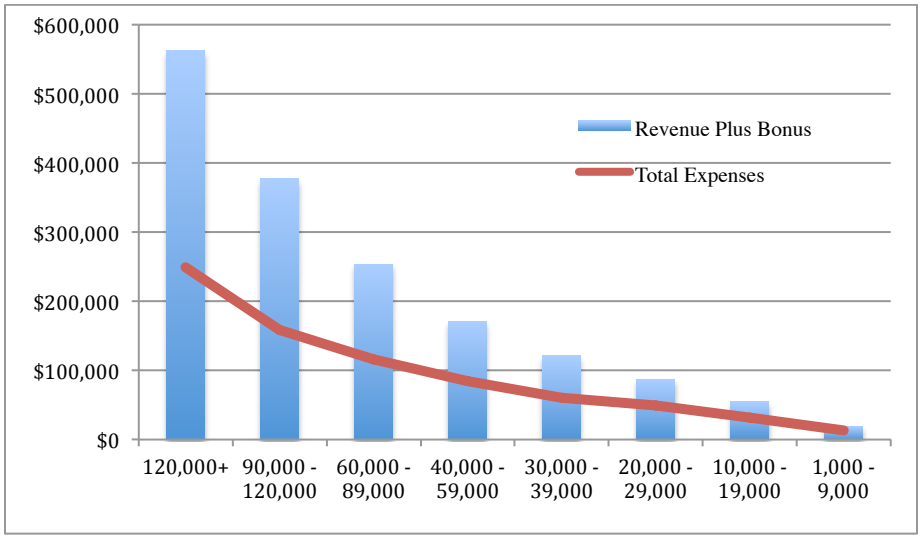



**Figure 13: Average annual business owner's gross revenue and total expenses, by category of pounds landed, for year 2010.**

The average statewide net individual business owner's operating income for lobster fishing operations of varying sizes (based on total annual catch) are shown in Table 4 below. Lobster operations in the highest tier (Over 90,000 pounds) are found only in Zones A, B, C, and D (Dayton, 2012).

**Table 4: Average annual business owner's annual operating income, by category of pounds landed, and the percent of license holders who currently fall within in each tier.**

| Landings Tier | Landings Per Year | Annual Operating Income (Survey in 2010) | % within Tier (For year 2011) |
|---|---|---|---|
| 0 | Under 1,000 lbs. | <0 | 29% |
| 1 | 1,000 to 10,000 lbs. | $2,800/yr. | 19% |
| 2 | 10,000 to 20,000 lbs. | $18,000/yr. | 14% |
| 3 | 20,000 to 30,000 lbs. | $38,000/yr. | 11% |
| 4 | 30,000 to 50,000 lbs. | $45,000/yr. | 14% |
| 5 | 50,000 to 90,000 lbs. | $65,000/yr. | 10% |
| 6 | Over 90,000 lbs. | $125k - $275k/yr. | 3% |

Operating income-per-trap also varies by size of fishing operation and also by zone (Figures 14 and 15) and shown by landing tier. The profit-per-trap is higher for fisherman who fish in Zones A, B, C, and D, and appears to be a function of average number of trap hauls, which is closely related to total traps fished, but can also be a function of a fisherman's skill and effort. This suggests that it may be difficult to predict individual profitability based on number of trap tags

purchased, since the number of trap hauls may be a better indicator of financial success (Dayton, 2012; Outreach Meeting minutes.)

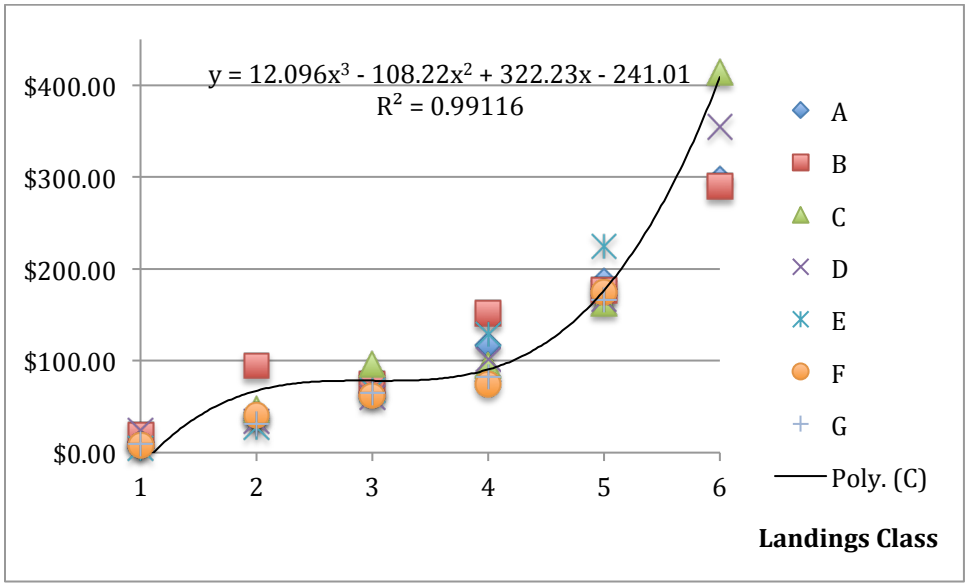



**Figure 14: Average net annual *operating income-per-trap fished*, by zone, by landings class, as measured in annual pounds landed (1 = low to 6 = high).**

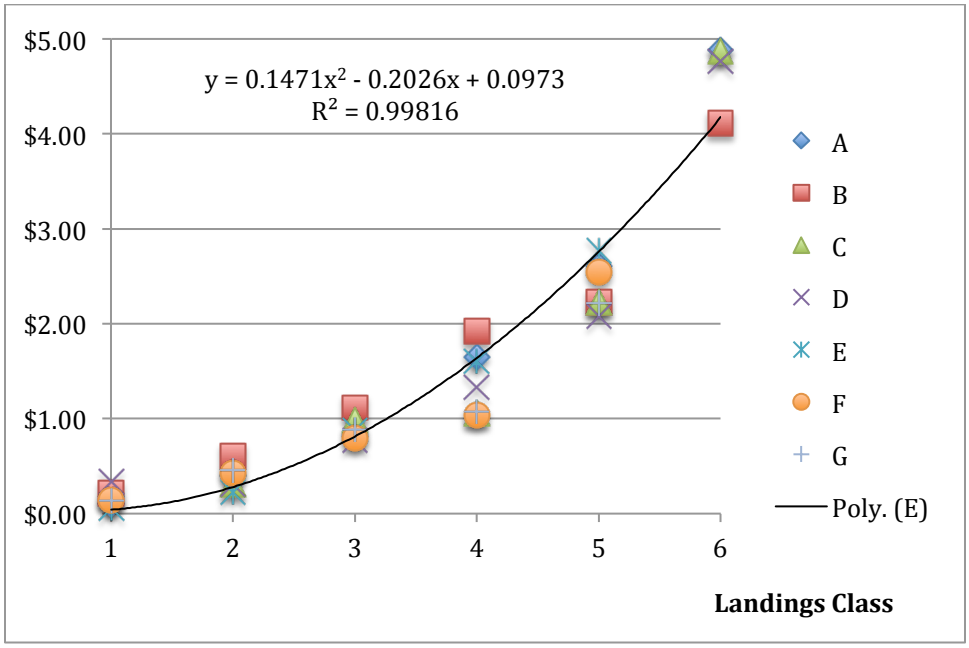



**Figure 15: Average annual net *operating income-per-trap hauled*, by zone, by landings classes as measured in annual pounds landed (1 = low to 6 = high)**

### *1.4 Cost of Excluding Individuals from the Fishery:*

The cost or benefit of excluding individuals from the fishery varies widely, and cannot be estimated effectively, given the uncertainly associated with the market and resource exploitation rates. Economic impacts and profitability scenarios can be modeled using tools available, but the underlying assumptions must be developed in collaboration with industry, at the regional level, and for a defined period of time.

In the course of attempting to answer this question, GMRI generated interesting data regarding the intentions of those on the waiting list. A total of 296 people statewide are waiting for a state lobster license in 2011; Zone E has 25 people on the waiting list while the other limited-entry zones each have between 50 and 60 people waiting.

Table 5 shows a breakdown of the 296 individuals who are waiting, by license type and current zone (if applicable), as well as desired zone of entry. A total of 43 people (15%) of those individuals on the waiting list wish to transfer zones. A significant number of transfers are sought from Zone C to B and from Zone F to G.

**Table 5: Composition of Waiting List by License Status, showing the current license status (if applicable) and current zone in the left columns, and the desired zone across the top.**

| NUMBER ON A WAITING LIST IN 2011 | | TOTAL | DESIRED ZONE | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | A | B | D | E | F | G |
| License Type | DECLARED ZONE | | | | | | | |
| License Holders Who Wish to Transfer Zones (LC1,2,&3) | A | 4 | . | 3 | . | 1 | . | . |
| | B | 3 | 1 | . | 1 | . | . | 1 |
| | C | 9 | . | 8 | 1 | . | . | . |
| | D | 2 | . | . | . | 2 | . | . |
| | E | 4 | 1 | 1 | 1 | . | 1 | . |
| | F | 19 | 1 | . | . | 2 | . | 16 |
| | G | 2 | . | 1 | . | . | 1 | . |
| | Subtotal | 43 | 3 | 13 | 3 | 5 | 2 | 17 |
| Apprentice and Student License Holders (LA & LCS) | DECLARED ZONE | | | | | | | |
| | A | 13 | 13 | . | . | . | . | . |
| | B | 3 | . | 3 | . | . | . | . |
| | C | 1 | . | 1 | . | . | . | . |
| | D | 9 | . | 1 | 8 | . | . | . |
| | E | 2 | . | . | . | 2 | . | . |
| | F | 11 | . | . | . | . | 11 | . |
| | G | 6 | . | . | . | . | . | 6 |
| | Subtotal | 45 | 13 | 5 | 8 | 2 | 11 | 6 |
| None - No active license but on waiting list | DECLARED ZONE | | | | | | | |
| | Subtotal | 208 | 40 | 40 | 47 | 18 | 31 | 32 |
| TOTAL | | 296 | 56 | 58 | 58 | 25 | 44 | 55 |

According to the 2012 Non-License Holders Survey results, approximately 60% of these new entrants indicate they wish to fish full-time, 29% indicate they wish to fish part-time seasonally, 9% indicate they wish to fish part-time year round, and less than 2% are seeking to fish recreationally. Figure 16 shows the number of trap tags this group has indicated they wish to fish, by zone.

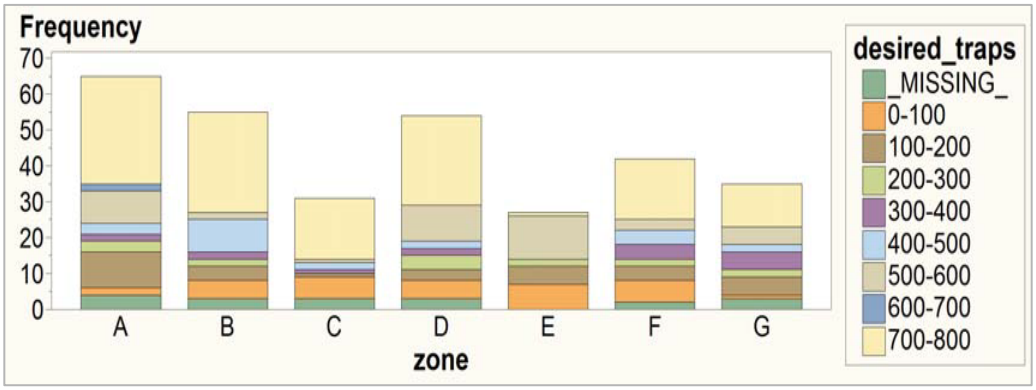



**Figure 16: Number of trap tags desired by new entrants (includes LA and LCS license holder responses and those on the waiting list), as indicated in the 2012 Non-License Holders Survey question #5: "How many traps do you wish to fish per year?"**

Based on the 2012 Non-License Holders Survey data, 26% of the people seeking entry to the fishery already fish (likely as a sternman) on a full-time basis, 14% fish on a part-time basis, and 33% are students. The average reported earnings for this group already in the fishery is $25,000/year. Forty percent earn less than $10,000/year.

The Lobster Profitability Simulator developed by GMRI, paired with the reported fishing effort intentions from the 2012 Non-License Holders Survey, plus an economic impact multiplier could be applied to calculate the economic value of the potential fisheries activity of members of waiting list. *However, the vast uncertainties associated with the current exploitation rate of the resource by zone, potential conflict on the water, effectiveness of new entrants, and the market price response introduce too much variability to the model to allow for such generalizations*.

### *1.5 Impact on the Coastal Economy:*

The relationship between direct activity and total economic influence is defined as the multiplier effect, and helps provide an estimate for the value of the fishery including shore services, transportation, and other infrastructure on land. This multiplier ranges from 2.5 to 4 times ex-vessel values in other jurisdictions, and a Maine specific multiplier has been most closely evaluated by Charles Colgan, who has suggested that multiplier of 2.75 be applied to estimate the value of Maine's fisheries. With 104 million pounds landed in 2011 and a boat price range of $2.75 to $4.25 as of October, 2012, the initial value of the catch is estimated at $334 million, with the overall total value of the fishery, including the catch and related shore side commerce, estimated at just over $1 billion.

## 2. Efficacy of Entry and Exit System

**Key Findings:**

In recent years, new entrants have accounted for less than two percent of licenses holders. Meanwhile, exit rates ranged from two percent to four percent per year, across all age groups. Lobstermen tend not to retire formally but rather reduce effort over time. On average, these retiring fisherman purchased 27% fewer trap tags in their final year than at their lifetime maximum. Therefore true trap retirement is under-counted, constraining new entry.

A large proportion of individuals have been waiting at least six years (post apprenticeship). Our analysis suggests that individuals in all zones, except for Zone C, are likely to wait an additional one to eighteen years depending on position in the waiting line, yielding a total time to get a license from beginning of training period, of 20 years or more. In the outreach meetings, and through phone calls, we heard that this does not foster further employment opportunities for those who have invested in the apprentice program, including many family members of current license holders, college graduates who went to school out of state, and veterans.

The provision for student license holders under 18 to enter the system without being placed on a waiting list has raised concerns about inequity. In addition, the policy has led some students under 18 to leave high school to allow them to put in enough time to earn a commercial license under the student provision.

We evaluated the efficacy of the limited entry system's two major components, entry and exit separately, although they are clearly closely related.

### *2.1 Exit Overview*

Licenses have decreased by a total of 856 Statewide (12% since 1997) (see Table 1) through formal retirement, attrition, and non-renewals.

The number of licenses that are retired each year is low, with an average number of retirees of ten to 15 individuals per year. Retirees are mostly individuals over 50, but a few retire at a younger age. The rate of licenses retired is estimated to be less than 0.1% of overall licenses issued per year. As we saw in Figure 5 (b), the non-renewal rate is estimated to be two percent to four percent per year, which equates to an average 205 people exiting per year.

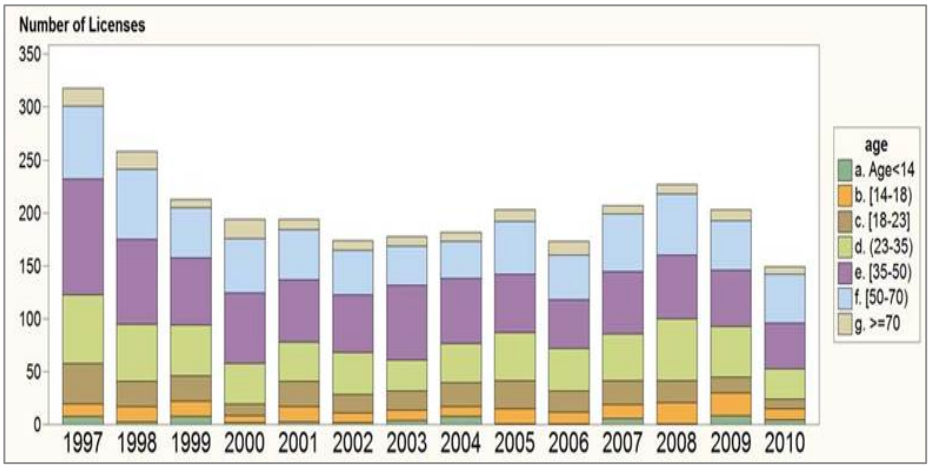



**Figure 17: Number of licenses retired or not renewed, by average age, for years 1997 to 2011**

The accounting method to determine the number of tags associated with a retiring license, from Figure 17 above, reveal that personal trap tag histories decline over time, with the number of trap tags issued in the last year of fishing being 27% lower than the maximum lifetime number purchased. To derive this estimate, we identified the lifetime maximum number of tags per year for the 153 registered retired license holders over the period 1997 to 2012 (group total 95,470 trap tags), and compared this with the final number of trap tags for these license holders upon retirement (group total 69,826 trap tags).

### *2.2 Entry Overview*

The overall number of new licenses issued has declined from 2000 to 2011, from an overall maximum of 200 new licenses issued in the year 2000, to a total of 62 new licenses issued Statewide in 2011 (Figure 18). The age of new license holders has also decreased on average during this time. In the most recent years we observe that of the new licenses issued a higher proportion are individuals aged 14-18.

A number of the calls and letters received during the outreach phase focused primarily on the subject of entry and exit. The sentiments expressed were at times heated, contentious, and emotional. Individuals on the waiting list report that they are currently unable to proceed into a fishing career or family business, or to take the next step from sternman to captain, despite five to six years commitment of time and financial resources. Family members seeking to pass on the fishing tradition to the next generation have found no mechanism to do so, other than to those who are under 18.

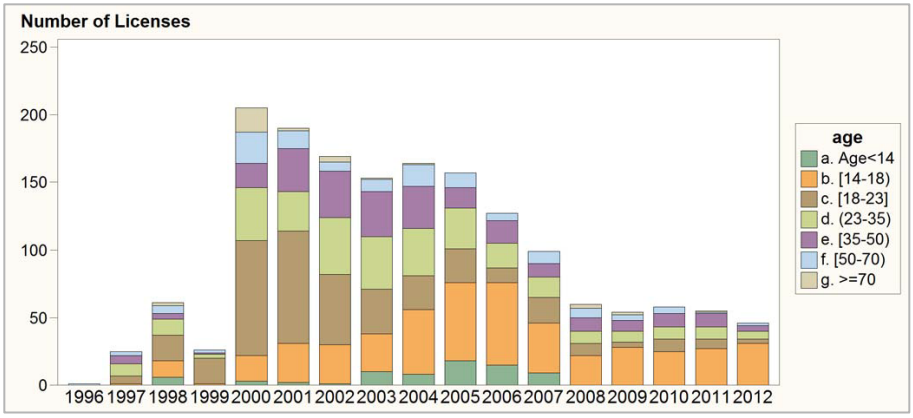



**Figure 18: Number of New Licenses Issued, by Average Age, for years 1997 to 2011 (Note: data for years 1996 to 1999 appear to be incomplete)**

Current waiting list estimates, based on an analysis of the license database shown in Figure 19 below, show that 47% of individuals have been waiting more than 5 years, and on average people on the waiting list have been there for six years, post-apprenticeship period.

A specific but subjective question in the 2012 Non-License Holders Survey, asked individuals to estimate their own wait time. Responders reported to expect to be on the waiting list on average at least an additional 10.8 years, and varying by zone, which is non inconsistent with our findings for their anticipated additional wait time.

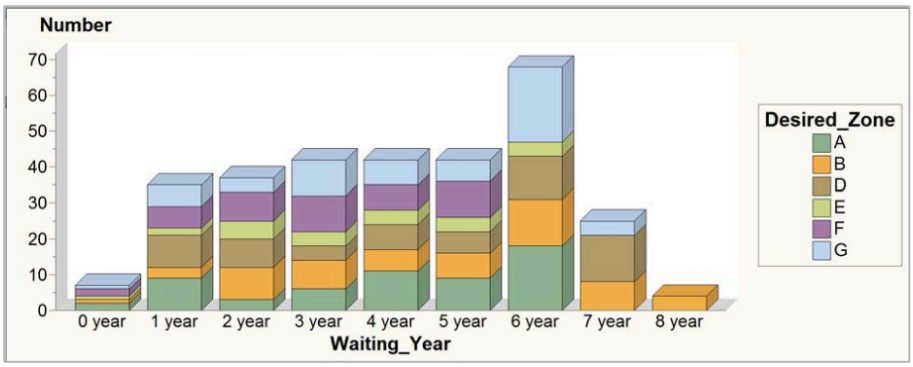



**Figure 19: Current Wait Time to Date for Those on the Waiting List**

In separate questions, the 2012 Non-License Holders Survey also shows that within the group seeking entry into the fishery 40% wish to take over the family business, 42% consider lobstering as their only occupation and wish to have their own business, and 18% wish to return to the fishery. Therefore, a majority of those individuals seeking entry have current or prior involvement with the lobster fishery.

According to the DMR lobster biologist, the resource is fully exploited in most zones except for possibly Zones A, B, and C (C. Wilson, pers. comm.). Thus new entrants will result in a reallocation of a portion of the harvest and associated revenue in most zones, although it is not possible to predict the amount of potential reallocation with the existing data. Areas of high trap

density may feel the impact from new entrants more than low trap density fishing areas (Wilson 2007). Geographical shifts in resource abundance will also naturally redistribute landings.

### *2.3 Apprentice Program*

The age composition of new LA license holders shown in Figure 20 shows an increase in the proportion of individuals aged 18-23 and 23-35 for 2008 to 2011, relative to 1998 to 2004 where there were both older and younger individuals included as well.

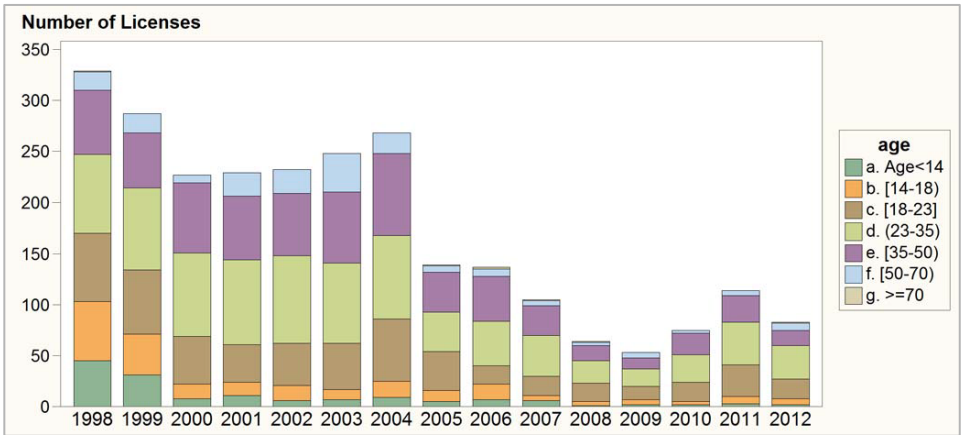



**Figure 20: Number of New Apprentice Licenses Issued, by Average Age, for years 1998 to 2012**

The total number of Apprentice licenses issued shows a decreasing trend overall. Zone A shows the most notable change in number of LA licenses issued, declining from 225 per year in 2004, to 50 per year in 2012. Most zones show a long-term decline in the number of LA licenses since 2004. Zone C, however, which also had a declining trend until 2009, has shown a recent doubling in the annual number of LA licenses issued, reflecting that there is incentive to be enrolled in the program.

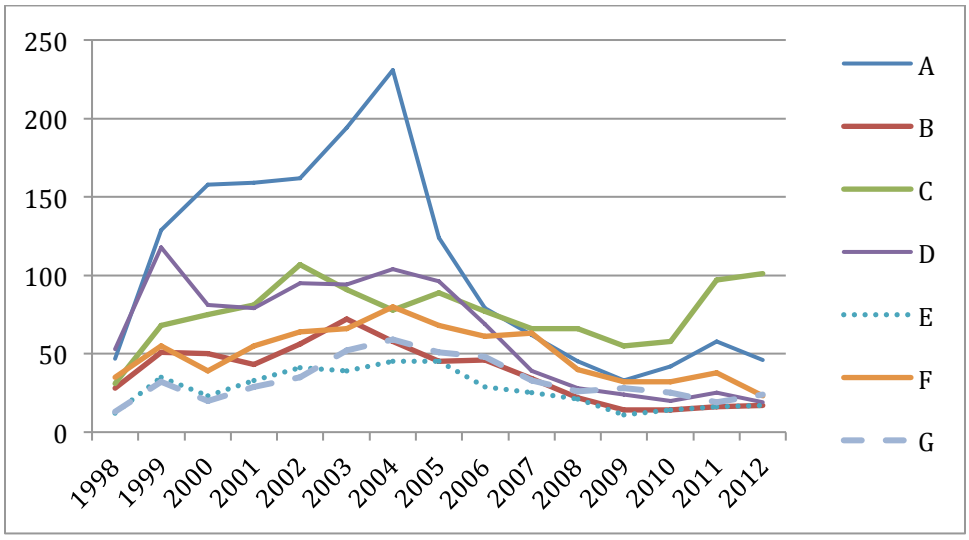



**Figure 21: Number of New Apprentice Licenses Issued, by Zone for years 1998 to 2012**

The Apprentice Program continues to be an important mechanism to ensure an individual's preparedness. Many fishermen cite a fully professionalized version of the program as a good way to support long-term community growth and resource stewardship. It also inherently limits entry in a way that ensures community acceptance and commitment of new entrants.

### *2.4 Student Program:*

The number of new LCS licenses issued by zone mostly saw a decrease from 2005 to 2010, and then increases, especially in Zones A, B, C, and D (Figure 22). Zones E and F have seen overall gradual long-term declines, and Zone G has remained stable but lowest in overall number of LCS licenses issued.

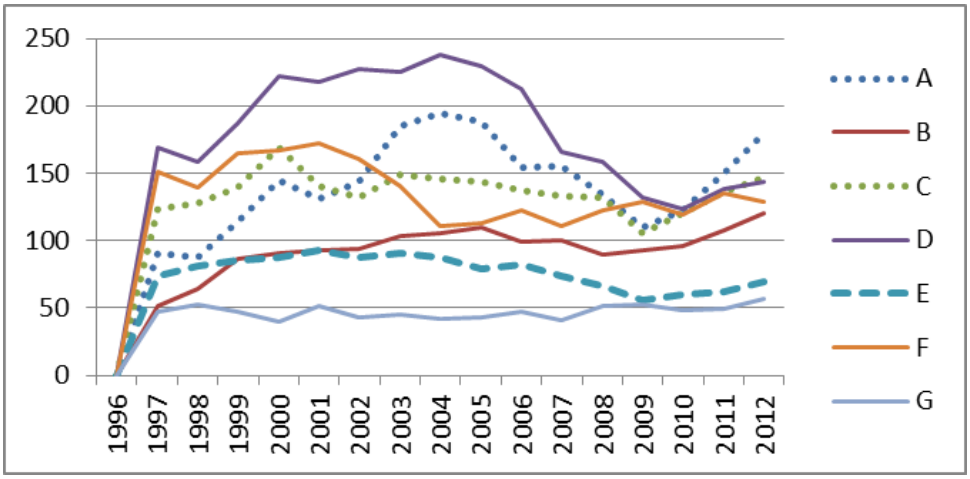



**Figure 22: Number of New Student Licenses Issued, by Zone for years 1998 to 2012**

Students hold an LCS license for an average of 3.5 years, and those aged under 18 are eligible to obtain a commercial license immediately upon completion of the program requirements (Figure 23). Students over the age of 18 who complete the Apprentice Program must wait on the zone waiting list.

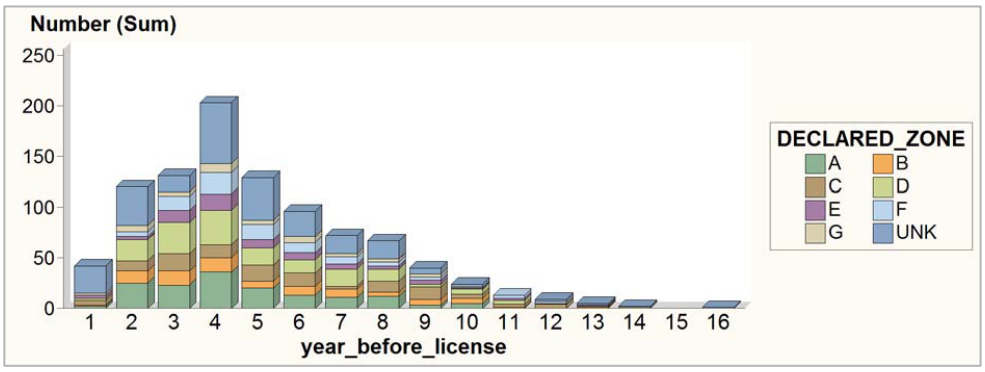



**Figure 23: Average length of time as LCS license holder.**

In 2011 a total of 351 (46%) of the LCS license holders had no reported landings, 259 (34%) landed under 1,000 pounds and only 19 (2%) landed above 5,000 pounds per year (Table 7).

**Table 7: Number of LCS License Holders, by pounds landed category for 2011**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| 0) [0] | 68 | 39 | 59 | 60 | 30 | 66 | 29 | 351 | 46% |
| a) (0-1k) | 52 | 35 | 43 | 47 | 24 | 40 | 18 | 259 | 34% |
| b) [1-5k) | 23 | 27 | 22 | 25 | 7 | 27 | | 131 | 17% |
| c) [5-20k) | . | 5 | 9 | 3 | . | . | . | 19 | 2% |
| Sum[1] | 143 | 106 | 133 | 135 | 61 | 133 | 47 | 761 | 100% |

[1] The number in each cell is omitted if fewer than three individuals were counted.

A total of 49,238 trap tags or 2% of the total trap tags are issued to LCS license Holders, who land 514,829 pounds per year, less than 0.1% of the total annual total catch (Tables 8 and 9). *Therefore, it appears that LCS License holders have a minimal impact on the resource.*

**Table 8: Total number of trap tags issued to LCS License Holders in 2011, by Zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| 0) [0] | 4,465 | 1,772 | 3,145 | 2,545 | 1,155 | 2,560 | 1,535 | 17,177 | 35% |
| a) (0-1k) | 2,480 | 1,795 | 3,310 | 1,961 | 1,650 | 1,985 | 1,435 | 14,616 | 30% |
| b) [1-5k) | 2,480 | 2,980 | 2,340 | 2,775 | 660 | 3,210 | . | 14,445 | 30% |
| c) [5-20k) | . | 900 | 1,350 | 400 | . | . | . | 2,850 | 6% |
| Sum[1] | 9,425 | 7,447 | 10,145 | 7,681 | 3,465 | 7,755 | 2,970 | 49,238 | 100% |

[1] The number in each cell is omitted if fewer than three individuals were counted.

**Table 9: Total pounds landed for all LCS License Holders in 2011, by Zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| 0) [0] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| a) (0-1k) | 17,089 | 10,801 | 16,731 | 15,714 | 5,838 | 10,885 | 7,981 | 85,039 | 17% |
| b) [1-5k) | 43,349 | 57,849 | 47,809 | 50,471 | 12,734 | 52,073 | . | 264,285 | 52% |
| c) [5-20k) | . | 40,653 | 79,634 | 28,588 | . | . | . | 162,728 | 32% |
| Sum[1] | 60,437 | 109,303 | 144,174 | 94,773 | 18,572 | 62,958 | 7,981 | 514,829 | 100% |

[1] The number in each cell is omitted if fewer than three individuals were counted.

**Table 10: Total landings value for all LCS License Holders in 2011, by Zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| 0) [0] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| a) (0-1k) | 48,383 | 35,976 | 54,285 | 49,864 | 19,329 | 36,440 | 32,276 | 276,553 | 17% |
| b) [1-5k) | 126,379 | 187,985 | 154,140 | 157,283 | 42,048 | 173,128 | . | 840,962 | 52% |
| c) [5-20k) | . | 143,218 | 252,337 | 84,565 | . | . | . | 519,561 | 32% |
| Sum[1] | 174,762 | 367,180 | 460,762 | 291,712 | 61,377 | 209,568 | 32,277 | 1,648,278 | 100% |

[1] The number in each cell is omitted if fewer than three individuals were counted.

**Table 11: Average number of trap tags purchased per LCS License Holder in 2011, by zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Average |
| 0) [0] | 62 | 44 | 51 | 41 | 37 | 38 | 51 | 47 |
| a) (0-1k) | 47 | 51 | 77 | 42 | 69 | 50 | 80 | 56 |
| b) [1-5k) | 108 | 110 | 106 | 107 | 94 | 119 | . | 110 |
| c) [5-20k) | | 150 | 150 | 133 | . | . | . | 143 |
| Sum[1] | 64 | 69 | 75 | 56 | 56 | 57 | 64 | 63 |

[1] The number in each cell is omitted if fewer than three individuals were counted.

Returning college graduates or others who have not renewed their license every year are subject to the full length of the waiting period. In addition, they need to fulfill the apprenticeship requirements, which may also deter entry into the fishery.

Since 1997, a total of 8,478 lobstermen were issued an LC1, LC2 or LC3 license, of which 932 came from the Apprentice Program, and 1,007 came in from the Student Program. This means that Statewide, over this time period, roughly half of the new entrants have come from each program. To estimate the rates at which apprentices and students convert to full-time commercial fisherman, we used the following approach as shown in Table 12 (a) below:

**Table 12 (a): Statewide rate of full commercial licenses issued from each source of new entrants (LCS, LA), for years 2001 to 2011, for all Zones**

| Year: | Existing Apprentice and Student Licenses over 18 years old (LA & LCS) | New LC123 Licenses off Waiting over 18 years old | % of LA group to awarded LC123 | Existing Student Licenses (LCS) under 18 years old | New LC123 Licenses under 18 years old | % of LCS under 18 years old group awarded LC123 | Total | % from LA and LCS over 18 years oldsource group | % from LCS under 18 years old source group |
|---|---|---|---|---|---|---|---|---|---|
| | (A) | (B) | (B)/(A) | (C) | (D) | (D)/(C) | (B)+(D) | (B)/(B+D) | (D)/(B+D) |
| 2005 | 420 | 81 | 19% | 602 | 78 | 13% | 159 | 51% | 49% |
| 2006 | 317 | 61 | 19% | 535 | 86 | 16% | 147 | 41% | 59% |
| 2007 | 251 | 56 | 22% | 550 | 49 | 9% | 105 | 53% | 47% |
| 2008 | 229 | 50 | 22% | 534 | 25 | 5% | 75 | 67% | 33% |
| 2009 | 193 | 30 | 16% | 504 | 27 | 5% | 57 | 53% | 47% |
| 2010 | 174 | 31 | 18% | 475 | 30 | 6% | 61 | 51% | 49% |
| 2011 | 209 | 36 | 17% | 520 | 31 | 6% | 67 | 54% | 46% |
| Average '09- '11 | **192** | **32** | **17%** | **500** | **29** | **6%** | **62** | **52%** | **48%** |

Statewide over the long-term, approximately equal numbers of new licenses were awarded from each program, as we see in Table 12 (a). The zones have allowed a recent average of 17% entry of the apprentices off the waiting lists, and a recent average 6% of students under age 18 have pursued a full commercial license.

A closer look at the entry rates for Zone C as compared to the remaining Zones yields important insights into the rate at which new licenses are awarded on a regional basis, as we see in Tables 12 (b) and Table 12 (c) below:

**Table 12 (b): Rate of full commercial licenses issued from each source of new entrants (LCS, LA), for years 2001 to 2011, for Zone C only**

| Year: | Existing Apprentice and Student Licenses over 18 years old (LA & LCS) | New LC123 Licenses off Waiting over 18 years old | % of LA group to awarded LC123 | Existing Student Licenses (LCS) under 18 years old | New LC123 Licenses under 18 years old | % of LCS under 18 years old group awarded LC123 | Total | % from LA and LCS over 18 years oldsource group | % from LCS under 18 years old source group |
|---|---|---|---|---|---|---|---|---|---|
| | (A) | (B) | (B)/(A) | (C) | (D) | (D)/(C) | (B)+(D) | (B)/(B+D) | (D)/(B+D) |
| 2005 | 54 | 27 | 6% | 104 | 6 | 6% | 33 | 82% | 18% |
| 2006 | 54 | 18 | 33% | 95 | 10 | 11% | 28 | 64% | 36% |
| 2007 | 44 | 8 | 18% | 99 | 3 | 3% | 11 | 73% | 27% |
| 2008 | 54 | 11 | 20% | 98 | 1 | 1% | 12 | 92% | 8% |
| 2009 | 51 | 18 | 35% | 85 | 4 | 5% | 22 | 82% | 18% |
| 2010 | 41 | 14 | 34% | 84 | 2 | 2% | 16 | 88% | 13% |
| 2011 | 64 | 22 | 34% | 88 | 3 | 3% | 25 | 88% | 12% |
| Average '09- '11 | **52** | **18** | **35%** | **86** | **3** | **3%** | **21** | **86%** | **14%** |

**Table 12 (c): Rate of full commercial licenses issued from each source of new entrants (LCS, LA), for years 2001 to 2011, for all Zones <u>excluding Zone C</u>**

| Year: | Existing Apprentice and Student Licenses over 18 years old (LA & LCS) | New LC123 Licenses off Waiting over 18 years old | % of LA group to awarded LC123 | Existing Student Licenses (LCS) under 18 years old | New LC123 Licenses under 18 years old | % of LCS under 18 years old group awarded LC123 | Total | % from LA and LCS over 18 years oldsource group | % from LCS under 18 years old source group |
|---|---|---|---|---|---|---|---|---|---|
| | (A) | (B) | (B)/(A) | (C) | (D) | (D)/(C) | (B)+(D) | (B)/(B+D) | (D)/(B+D) |
| 2005 | 366 | 54 | 15% | 498 | 72 | 14% | 126 | 43% | 57% |
| 2006 | 263 | 43 | 16% | 440 | 76 | 17% | 119 | 36% | 64% |
| 2007 | 207 | 48 | 23% | 451 | 46 | 10% | 94 | 51% | 49% |
| 2008 | 175 | 39 | 22% | 436 | 24 | 6% | 63 | 62% | 38% |
| 2009 | 142 | 12 | 8% | 419 | 23 | 5% | 35 | 34% | 66% |
| 2010 | 133 | 17 | 13% | 391 | 28 | 7% | 45 | 38% | 62% |
| 2011 | 145 | 14 | 10% | 432 | 28 | 6% | 42 | 33% | 67% |
| Average '09- '11 | **140** | **14** | **10%** | **414** | **26** | **6%** | **41** | **35%** | **65%** |

These results indicate that at least one third of the total Statewide new entry from the Apprentice program (i.e. the waiting list) takes place in Zone C, and the two thirds is distributed among the other six zones. Conversely, Zone C has a smaller proportion Students entering the fishery, and the other zones have a higher proportion. This suggests that Apprentices in Zone C continue to have incentive, where students in Zone C do not have the same imperative to obtain a license prior to age 18.

The current system limits entry of individuals over 18, but does not limit the entry of those who are under 18, creating an urgency to complete the Student Program which can compete with school and other activities. There is no upper limit on the number of students under 18 who can obtain a full commercial license each year and subsequently build up to the 800 trap limit. Therefore, a cap on total effort has not been clearly established.

## 3. Effect of Latency of Licenses and Trap Tags

**Key Findings:**

Landings reports show that 1,107 (22%) of current license holders had no landings at all in the past year, and purchased 391,142 (14%) of the currently issued trap tags. In addition, current license holders are eligible to purchase an additional 987,502 trap tags (a potential 25% increase). Combined, this results in a 39% overall latency within the system, which is down from 55% latency in 1997. Of this, 88% of the potential trap build-up is available to fishermen in the low landings categories, under 10,000 pounds per year.

The number of total licenses issued would poses less concern if they are not associated with the current potential maximum of 800 traps or the potential to build up to this level. Currently, the risk posed by the latent effort is high from a resource management perspective, especially given the ASMFC's view that the amount of effort in the fishery is already of concern.

The mandatory dealer reports were used to generate the data below, and therefore do not include sales of lobster which are direct to the public. These data do not include student and apprentice data, but do include unregistered, double, and second tag data. The discussion of licenses and trap tags are presented individually below.

Tables 13, 14, and 15:

On the upper end of the annual pounds landed spectrum, of the total group of 4,933 commercial (LC1, LC2, and LC3) license holders, 1020 (19%) landed 40,000 pounds or more each in 2011, for a combined annual catch of 62.2 million pounds (60% of total landings), and purchased 740,650 (26%) of the total tags issued. This group is eligible to purchase an additional 9,350 tags, suggesting there is less than 1% additional build-up of trap tags within this group, or *less than 1% latency in the over 40,000 pounds landed per year category.*

On the lower end of the annual pounds landed spectrum, of the total 4,933 commercial license holders, 1,107 (22%) did not have any landings at all in 2011, 308 (7%) landed less than 1,000 pounds, and 939 (19%) landed less than 10,000 pounds. This group of 2,354 license holders (48% of total license holders) landed a combined 14,980,283 pounds, less than 14% of the total catch, and they purchased 984,156 (35%) of the total tags issued. This group of license holders is eligible to purchase another 845,444 tags, suggesting that *there is a 46% potential additional build-up of tags, or latency, within this group of license holders who land less than 10,000 pounds per year each.*

**Table 13: Number of LC1, LC2, and LC3 License Holders, by pounds landed category for 2011**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| 0) [0] | 195 | 69 | 146 | 191 | 122 | 261 | 123 | 1,107 | 22% |
| a) (0-1k) | 63 | 29 | 38 | 58 | 45 | 49 | 26 | 308 | 7% |
| b) [1-10k) | 211 | 79 | 115 | 191 | 101 | 152 | 90 | 939 | 19% |
| c) [10-20k) | 160 | 62 | 98 | 140 | 60 | 104 | 50 | 674 | 14% |
| d) [20-30k) | 107 | 50 | 67 | 118 | 59 | 76 | 40 | 517 | 11% |
| e) [30-40k) | 71 | 55 | 55 | 81 | 27 | 56 | 23 | 368 | 8% |
| f) [40-50k) | 64 | 41 | 64 | 70 | 13 | 51 | 13 | 316 | 6% |
| g) >=50k | 107 | 108 | 258 | 122 | 19 | 60 | 30 | 704 | 13% |
| Sum | 978 | 493 | 841 | 971 | 446 | 809 | 395 | 4,933 | 100% |

**Table 14: Total number of trap tags issued to LC1, LC2 and LC3 License Holders in 2011, by Zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| 0) [0] | 76,721 | 24,416 | 58,965 | 78,263 | 35,378 | 84,480 | 32,919 | 391,142 | 14% |
| a) (0-1k) | 23,280 | 11,040 | 15,360 | 19,501 | 17,150 | 20,220 | 10,260 | 116,811 | 4% |
| b) [1-10k) | 115,920 | 38,605 | 57,850 | 95,450 | 46,210 | 78,903 | 43,265 | 476,203 | 17% |
| c) [10-20k) | 109,385 | 36,825 | 55,110 | 107,280 | 39,745 | 80,127 | 41,125 | 469,597 | 16% |
| d) [20-30k) | 89,800 | 45,075 | 48,970 | 79,500 | 29,900 | 56,715 | 34,400 | 384,360 | 13% |
| e) [30-40k) | 60,050 | 36,925 | 50,550 | 70,600 | 13,800 | 51,300 | 14,400 | 297,625 | 10% |
| f) [40-50k) | 46,600 | 31,100 | 44,500 | 59,150 | 12,000 | 31,050 | 11,200 | 235,600 | 8% |
| g) >=50k | 88,800 | 72,700 | 196,550 | 90,800 | 6,000 | 35,800 | 14,400 | 505,050 | 18% |
| Sum[1] | 610,556 | 296,686 | 527,855 | 600,544 | 200,183 | 438,595 | 201,969 | 2,876,388 | 100% |

**Table 15: Total pounds landed for all LC1, LC2 and LC3 License Holders in 2011, by Zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Total | % |
| a) (0-1k) | 25,851 | 9,775 | 18,862 | 27,115 | 19,978 | 24,472 | 11,956 | 138,008 | 0 |
| b) [1-10k) | 1,061,274 | 445,471 | 542,961 | 849,798 | 479,500 | 668,255 | 357,339 | 4,404,600 | 4% |
| c) [10-20k) | 2,211,750 | 885,785 | 1,431,104 | 2,309,003 | 1,031,908 | 1,724,802 | 843,322 | 10,437,675 | 10% |
| d) [20-30k) | 2,866,433 | 1,570,858 | 1,670,614 | 2,625,368 | 1,275,702 | 1,783,476 | 1,096,141 | 12,888,593 | 12% |
| e) [30-40k) | 2,668,468 | 1,819,958 | 2,430,445 | 3,091,520 | 808,472 | 2,339,348 | 638,425 | 13,796,636 | 13% |
| f) [40-50k) | 2,635,430 | 1,906,989 | 2,565,703 | 3,362,988 | 892,170 | 1,769,025 | 618,905 | 13,751,210 | 13% |
| g) >=50k | 8,202,069 | 6,788,605 | 20,708,389 | 7,930,555 | 625,356 | 2,929,677 | 1,276,523 | 48,461,174 | 47% |
| Sum[1] | 19,671,275 | 13,427,443 | 29,368,077 | 20,196,347 | 5,133,086 | 11,239,054 | 4,842,612 | 103,877,896 | 100% |

In aggregate for 2011, a total of 4,932 license holders are eligible to purchase 3,856,600 tags (estimated based on the 800 tags maximum per license holder in all zones except Zone E which has a maximum of 600 tags). However, of this only 2,876,388 were issued, which indicates that there are an additional 980,212 trap tags that could be issued any time and are therefore considered latent. Therefore, there is a total 25% latency associated with unissued trap tags*, of which 88% of the trap tag build-up is available to fishermen in the low landings categories, under 10,000 pounds per year*.

For comparison, in 1997 there were a total of 7,056 license holders eligible to purchase at least 800 trap tags each (Table 1(a)), for a total of 5,644,800 tags. Of these a total of 2,481,298 were issued, indicating that there was an additional 3,163,502 trap tags that could be issued any time, or a total latency of 56% within the system. Therefore since 1997, there has been a decrease in the latency of unissued trap tags within the system from 56% down to 25%.

*When the total 25% latency associated with un-issued trap tags is combined with the 14% latency associated with trap tags that do not have any landings, we estimate a 39% overall total latency within the current limited entry system.*

The average number of tags issued for all zones, by landings volume, shows that individuals with landings below 10,000 pounds purchase an average of 500 trap tags, whereas those individuals with landings above 40,000 pounds purchase an average of 750 trap tags each (Table 16). However, our profitability simulations suggest that on average the number of tags purchased by license holders, exceeds the quantity needed to maintain this level of harvest.

**Table 16: Average number of trap tags purchased per LC1, LC2 and LC3 License Holder in 2011, by zone and by category of pounds landed**

| Landings | DECLARED_ZONE | | | | | | | All |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Average |
| 0) [0] | 329 | 290 | 329 | 312 | 247 | 283 | 242 | 295 |
| a) (0-1k) | 358 | 368 | 357 | 310 | 336 | 355 | 293 | 340 |
| b) [1-5k) | 540 | 451 | 486 | 503 | 450 | 496 | 481 | 496 |
| c) [5-20k) | 724 | 614 | 562 | 686 | 568 | 685 | 709 | 661 |
| d) [20-30k) | 774 | 715 | 706 | 764 | 575 | 788 | 764 | 737 |
| e) [30-40k) | 780 | 710 | 733 | 784 | 600 | 777 | 800 | 753 |
| f) [40-50k) | 790 | 723 | 781 | 789 | 600 | 776 | 800 | 765 |
| g) >=50k | 800 | 773 | 793 | 796 | 600 | 796 | 800 | 789 |
| Sum[1] | 595 | 582 | 598 | 576 | 424 | 513 | 489 | 553 |

The number of tags issued to an individual does not necessarily reflect their true level of fishing effort. The data in Figure 24 show the annual pounds landed against the number of trap tags purchased. This figure reveals a high degree of variability in the efficiency of fishing operations, and similar landings quantities for individuals with differing numbers of trap tags.

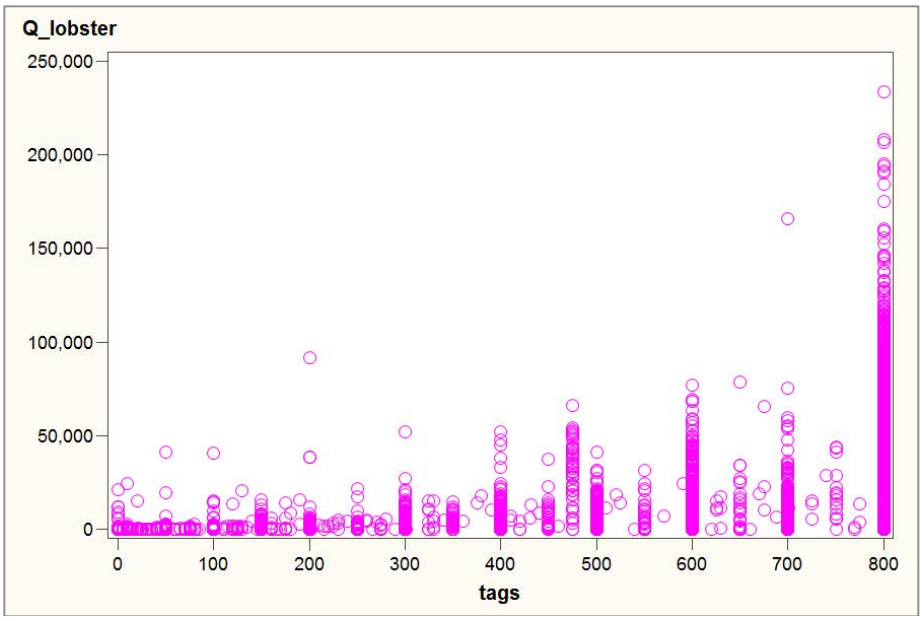



**Figure 24: A scatter plot of total pounds landed for individuals with varying numbers of trap tags for 2011. Each individual is represented by one circle.**

The 2012 License Holders Survey responses indicate that 27% of all fishermen favor eliminating latent trap tags, 11% had no opinion, and 57% were not in favor (Figure 25). However, respondents who land less than 20,000 pounds per year are largely opposed to the elimination of latent tags, while 50% of fishermen landing more than 20,000 pounds are generally in favor of eliminating latent tags.

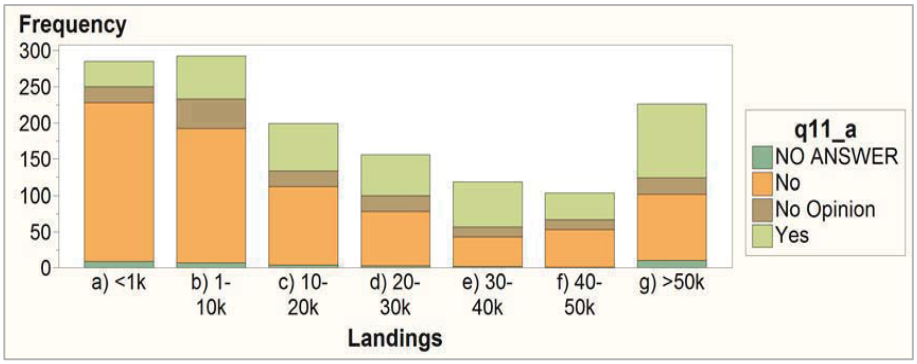



**Figure 25: 2012 License Holders Survey responses to question #11 "Do you favor eliminating latent effort in the form of trap tags that are issued but not fished?"**

A lobsterman's license becomes a part of his identity and his intentions must be allowed to change over time. It is important to acknowledge a person's community standing. Individual situations, described through industry feedback received during the project's outreach phase, shed light on this issue:

- License holder has fished all of his/her life but is no longer active. He has retained a current license and has significant prior landings history, but low or no landings in the past three to five years. He has no plan to fish in the coming year, regardless of number of tags purchased. He derives his personal identity from the fishery, and may likely still have a boat and other family actively fishing.

- License holder maintains a current license but has no landings history in five years and no plan to fish in the coming year, regardless of number of tags purchased. He values the option to return to the fishery at some time in the future, but has no active plan to gear up. He pays the annual fee as insurance or as an investment in a future option.

- License holder may show no landings due to double-tagging requirements among family businesses.

- License holder fishes actively in this and other fisheries, and may purchase extra tags as a provision against loss, damage, or theft.

- License holder has crab landings, but no or low lobster landings. Crab have increasingly become a target species and are also a productive bycatch for lobstermen.

- License holder may be newly licensed, and building up to an optimum number of tags before engaging in any fishing activity as a way to build his business to scale.

Efforts to reduce latent tag or license holdings could potentially have a negative impact on management cost recovery; the annual revenue associated with latent tags plus associated license fees may be significant.

According to the ASMFC, the amount of effort in the fishery is of concern. Latent tags have the potential to be fished anytime, and therefore must be considered active even if they are not fished. This latency poses a significant risk, both to the management of the resource and the future profitability of current active fishermen, especially in high-density fishing areas (Wilson, 2007).

## 4. Ramifications of Existing Age Structure

**Key Findings:**

The average age of the existing fishing population has continued to increase over the past 17 years, and a large cohort of fishermen continue to fish as long as they can, many until the age of 80. We also see that the current license system allows younger people (17 and under) to gain access to the fishery, but that only a small number (4%) of people who began as students converted to full-time commercial fishing prior to turning 18. Current waiting list policy prevents reintegration of these individuals if they allowed their license to lapse. There are many fewer license holders aged 23 – 40 than other age groups.

An age and growth chart for all fishermen can be seen in Figure 26 below, where the age of the fishermen is plotted for each year for the past 17 years (e.g. a fisherman who was 30 in 1996, will appear as a 31 year old in 1997 and will appear as 46 years old in 2012 if he/she stays in the fishery as a LC1, LC2, LC3, LA, or LCS license holder). Note: the size of each of the bubbles in the graph represents the number of fishermen in that age group in that year.

The 17-year age composition analysis of all license holders in all zones identifies several distinct cohorts of fishermen. The oldest and largest cohort is now between 50 and 60, and is not expected to begin to slow down for another five to seven years.

There are many fewer fishermen in the 18 – 47 age group in 2012. Despite the priority licensing policies for students, there is a strong pattern of exit from the fishery at age 18, likely associated with students not fully completing the program prior to their 18$^{th}$ birthday. The waiting list length has been reported as a deterrent for students who are over 18 to continue with the program, and negatively impacts the conversion rate of these individuals into the fishery as full-time commercial fishermen.

The ten-year average conversion rate of LCS license holders to full-time active commercial fishermen is 5%, and has ranged between 3% and 10%. Since they are issued new tags, and their entry is not counted in the exit ratios, their entry into the fishery does not hinder the entry of individuals from the waiting list.

The rate at which Student License holders convert to full time commercial fisherman is allowed to vary every year with no upper limit set on total number of students admitted by zone or by year. Therefore, this policy has effectively by-passed effort reduction goals, and resource conservation mechanisms, for it allows for additional trap build up over time. It has also raised questions of fairness.

Older fishermen continue to renew their licenses and tags for most of their life, and only 'exit' very late in their life, if at all. The observed trend, where older fishermen slow down and purchase fewer tags in the years prior to exiting, hinders individuals on the waiting list because

the final number of tags retired when this individual exits may be significantly lower than what this person fished over the recent years. We estimated that the number of exiting tags is likely underestimated by at least 27%, which was derived by evaluating the maximum lifetime number of trap tags against the final number of trap tags, for exiting fishermen.

An analysis of the age of individuals currently on the waiting list for each zone shows that more than 50% of those desiring licenses are between 18 and 39, which is the age group with the least number of individuals in the current fishery.

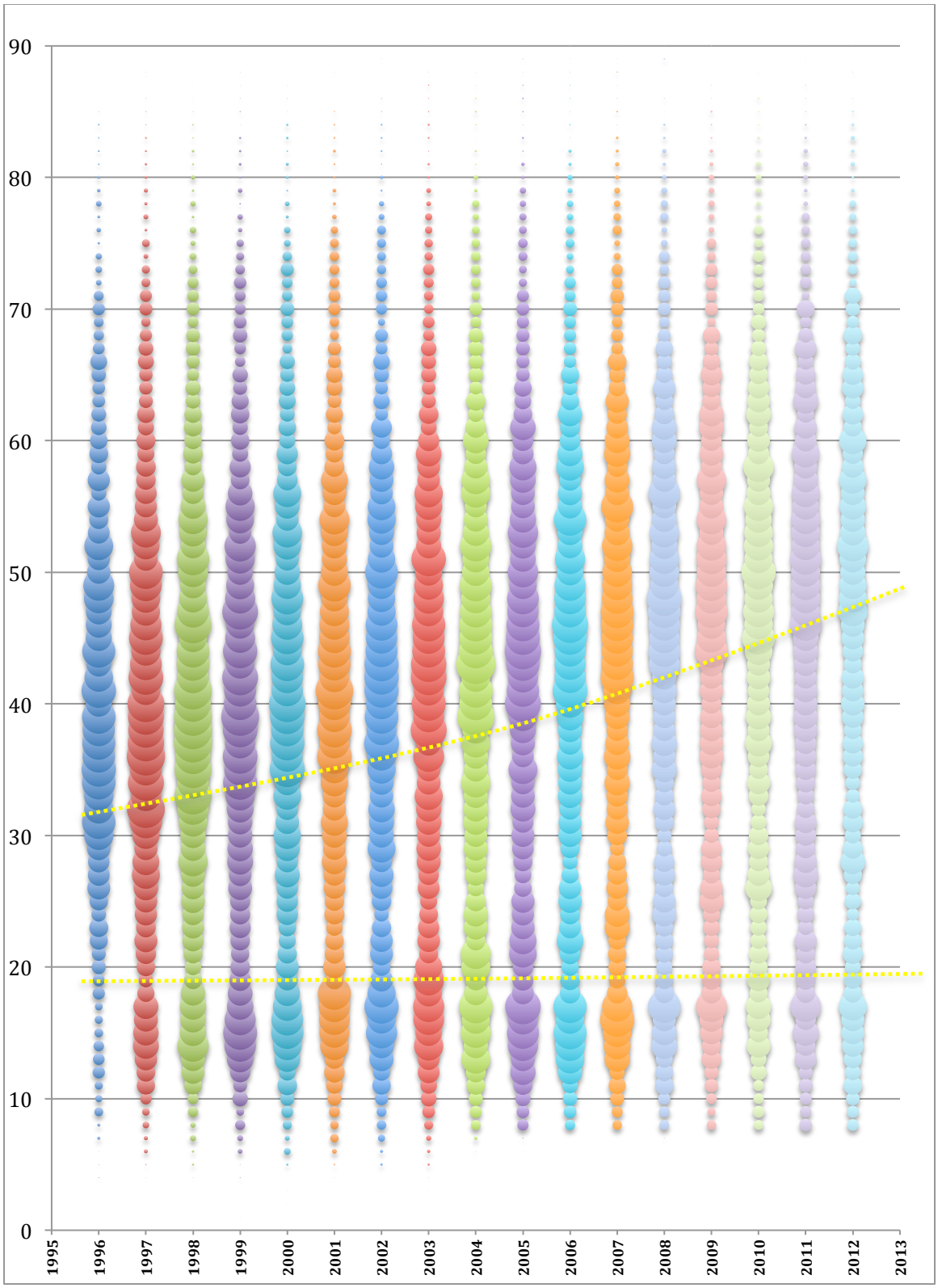



**Figure 26: Age composition of license holders for years 1997 – 2012. Size of bubble reflects number of individuals in that category (larger bubble = more people; small bubble = few people)**

## 5. Utility of the existing system for conserving the lobster resource

**Key Findings:**

Waiting lists have reduced the number of commercial licenses overall, but not the total number of tags issued. The increase in tags has kept pace with increases in resource abundance, at least in Zones A, B, and C. And while the system appears able to handle small changes in resource abundance, the current system would be ineffective in responding to large declines in resource abundance, which could result in overfishing.

The number of overall license holders has decreased by 12% since 1997, but the number of trap tags issued has increased by 14% (Table 1). This indicates that the current system has not capped effort in the fishery.

The rate at which the system is able to respond to changes, especially downward trends in resource abundance, is not clearly understood in Maine. A further discussion on this point is offered in Objective III below.

Based on the 2012 License Holders Survey, we see that concerns over the fishing effort vary somewhat by zone. Overall responses indicate that 29% are very worried, and 35% are somewhat worried. A total of 30% said they were not worried at all.

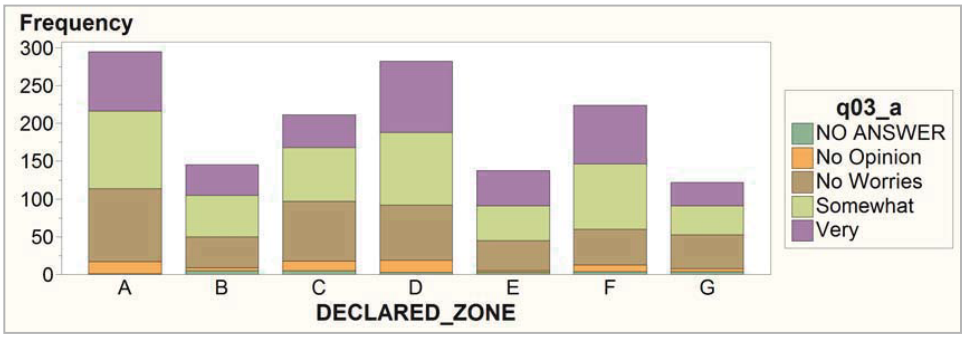



**Figure 27: 2012 License Holders Survey responses to question #3 "How worried are you about the number of traps fished in your Zone?"**

From the information presented in Objective III, it is clear that the current limited entry system for Maine lobsters will not be sufficient to control effective effort and fishing mortality on the stock if a major biological conservation concern develops in the fishery. Evidence from jurisdictions in New Zealand, Western Australia, and Florida support this statement.

Based on the information presented from other jurisdictions in Objective III, if such a situation arises, serious consideration will need to be given to the implementation of an alternate management system, such as a quota system to control effective effort and fishing mortality.

However, based on the 2012 License Holders Survey Results shown in Figure 28 below, at this time a quota management system would not be favored as an immediate option for the Maine lobster fishery.

**Figure 28: 2012 License Holders Survey responses to question #3 "Do you support an overall limit on total lbs. of lobster landed in Maine per year?"**

## Objective III: Lessons From Other Relevant Fisheries

**Key Findings**:

Historically, lobster and spiny lobster fisheries worldwide have been managed primarily through the use of input controls rather than output controls (e.g., quotas). Use of input controls that restrict or limit participation and the level of fishing activity (limited entry, trap limits and tags, closed seasons, etc.) are best used to address socio-economic issues and concerns (e.g. the ability of fishermen to enter/exit the fishery, gear conflicts, product quality, etc.), and *not biological-conservation concerns*. A number of jurisdictions have moved from input controls to output controls (usually individual transferable quotas) over the last 20 years as a response to major biological-conservation concerns. Most jurisdictions, e.g. New Zealand, South Australia, Tasmania (Ford, 2001), and West Australia, have made this move during or after resource declines and not before the resource decline began.

Jurisdictions operating with a form of limited entry have identified latent effort as a major concern for the risk it poses to the effective management of the resource, and have employed a variety of tools to address this issue. Predominantly landings history for a retrospective period of five years has been used to ascertain license or permit status and level of effort awarded upon a transition to a new system. Adjustments to number of trap tags have been handled through an annual qualification mechanism, or on the open market through a cap and trade mechanism.

### 1. Discussion of Various Jurisdictional Components and Impacts

The key points from other lobster and rock lobster fisheries presented in Appendix G that are relevant to the future management of the Maine lobster fishery are summarized in this section. More detailed information can be found in the references cited in Appendix G.

#### *1.1 Addressing Socio-economic Concerns:*

Input controls that restrict or limit participation and the level of fishing activity (limited entry, trap limits and tags, closed seasons, etc.) are best used to address socio-economic issues and concerns (e.g. the ability of fishermen to enter/exit the fishery, gear conflicts, product quality, etc.) and <u>not biological-conservation concerns</u>

**Table 17: Input controls used world-wide and in Maine**

| | World-wide | Maine |
|---|---|---|
| Limited entry (licenses) | ✓ | ✓ |
| "Use it or lose it" provisions on licenses | ✓ | |
| Trap limits | ✓ | ✓ |
| Size limits (both minimum and maximum) | ✓ | ✓ |
| Restrictions on individual traps (size; dimensions; escape vent number, size, and placement) | ✓ | ✓ |
| Prohibition on landing egg-bearing and/or mature females (V-Notch) | ✓ | ✓ |
| Season timing and length restrictions | ✓ | |
| Specification of maximum number of days-at-sea fished | ✓ | |
| Specification of maximum number of trap-hauls | ✓ | |

Input controls provide, at best, only moderate control of the effective fishing effort and therefore fishing mortality on the stock. They are best used in fisheries where the stock is only lightly exploited and where there are no biological-conservation concerns for the stock.

Decisions on the number and form of input controls (e.g. license numbers, license transferability, qualifications for license allocation and retention, "use it or lose it" provisions, trap numbers and trap transferability, seasons, etc.) are socio-economic decisions best made after extensive consultation with the fishery stakeholders.

Canada has implemented tactical management measures to achieve its key socio-economic goals and objectives, including: (a) providing for flexibility in policy and licensing; (b) promoting stability in access to resources and allocations; and (c) allowing for self-adjustment of capacity to resource availability.

### *1.2 Addressing major biological-conservation concerns*

Addressing major biological conservation concerns using input controls requires continual adjustment of the controls (reductions in trap limits, reductions in days fished, trap hauls per day, etc.) that usually result in increasingly severe restrictions on the fishery to very low and uneconomic levels.

Output controls (either total competitive quotas or individual transferable quotas) provide the most effective management tools to directly control effective fishing effort and fishing mortality on the stock (see references for South Australia and West Australia in Appendix G). A number of jurisdictions have moved from input controls to output controls (usually individual transferable quotas) over the last 20 years as a response to major biological-conservation concerns. Most jurisdictions, e.g. New Zealand, South Australia, Tasmania (Ford, 2001), and West Australia, have made this move during or after resource declines and not before the resource decline began.

As a result of a substantial resource decline in the Outer Cape Cod fishery in the past five years, Massachusetts has identified the need to reduce traps in the water by more than 50% over the

next five to six years in that fishery. An across-the-board reduction method is likely to be used, where fisherman reduce traps fished by a certain percentage. Because Massachusetts allows transferrable tags, the process is likely to result in some fishermen in the Outer Cape Cod fishery exiting the fishery and selling their remaining trap tags to others who wish to build back up to the maximum number.

### *1.3 Addressing Latent Effort*

Latent effort remains a concern with the current license system and should be addressed, according to the ASMFC. Latency takes several forms:

- Licenses with no landings, currently eligible for 800 trap tags;
- License holders who purchase an excessive number of tags for the level of landings.

Many jurisdictions have identified this as one of the fundamental issues hampering effective resource management because it provides a pool of inactive effort that has the potential to increase at any time in the future. As a result, most jurisdictions have sought to address this latent effort through a variety of ways discussed below.

"Use it or Lose it"

- Rhode Island engages in an annual review of historical landings, and offers priority to certain applicant types such as crewmen. The state has recently introduced an annual review of landings and licenses, and licenses with no landings are retired.

Licensing Tiers

- In California, a new system based on seven tiers has been developed for the Dungeness Crab fishery. This was co-developed with industry and provides for flexibility in the fishery.

- In 2008 Maine DMR was asked to prepare a discussion document for the Maine Lobster Advisory Council concerning the implementation of a tiered licensing system for the lobster fishery. The proposal was not advanced, but could be used as a basis for initiating planning and discussions if this option is chosen for future management of the Maine fishery. One of the goals of the proposal was to implement an overall trap reduction program to reduce effort.

- New Hampshire has a three tier licensing system for lobsters (commercial, limited commercial, and part-time) based on previous license ownership and landings history. Each of the three separate license tiers has its own trap limits and license transfer eligibility rules. New rules are being enacted in 2012 to address the significant concerns expressed over the latency in the number of inactive limited commercial licenses in the fishery.

Trap tag retirement programs

- Two jurisdictions, Florida and Massachusetts, have implemented trap retirement programs by using a trap "tax" to remove a certain percentage of traps from the fishery each time a license and its associated traps are transferred. Massachusetts retires 10% of the traps while Florida retires 25% of the traps at each license transfer.

### *1.4 Development of Management Plans*

Most jurisdictions have developed fishery management plans for their lobster fisheries that set out the "vision" for the fishery and contain clear goals and objectives (including both socio-economic and biological-conservation) and strategies for achieving the goals and objectives. An outline of a typical fishery management plan is found in Appendix J. Examples of fishery management plans are found in the references for the South Australian and West Australian fisheries. The components of a management plan are best developed through extensive consultations between managers, scientists, and the users of the resource.

## 2. Longer Term Resource Management Considerations for Maine

**Key Findings:**

Modeling results indicate that the Gulf of Maine lobster stock abundance is declining and fishing mortality is increasing in recent years. Based on lessons learned from other jurisdictions, the current limited entry system for Maine lobsters will not be sufficient to control effective effort and fishing mortality on the stock if a major biological conservation concern develops in the fishery.

The following recommendations are based on lessons learned from other jurisdictions and the personal experiences of the authors.

The 2009 American Lobster Stock Assessment Report for Peer Review produced by the Atlantic States Marine Fisheries Commission (Stock Assessment Report No. 90-01 (Supplement)) concluded the following: "The Gulf of Maine stock is in favorable condition based on the recommended reference points. The stock is above the reference abundance threshold and slightly below the effective exploitation threshold. Therefore the Gulf of Maine lobster stock is not depleted and overfishing is not occurring." The report goes on to add that assessment results suggest careful consideration of key issues:

- Effective exploitation is likely at or near the long-term median. Given uncertainty in model estimates and population variability, it is possible that overfishing may be occurring now or will occur between now and the next assessment. In addition, model results indicate that overfishing is occurring in the Gulf of Maine (GOM).

- Record high landings have been supported by a long period of excellent recruitment. Recruitment failures could rapidly cause the status of the stock to worsen.

- Effort levels in recent years are the highest observed since 1982 (both in number of traps and soak time indicators).

- Statistical area 514, waters off the coast of Massachusetts, has continued to experience declines in recruitment and abundance since the last assessment.

- Relatively few females have the opportunity to spawn at least once prior to harvest, given only 12% of lobsters are mature at the minimum legal size.

- The Northeast Fisheries Science Center (NEFSC) fall survey index of relative abundance of lobster has steadily declined in recent years, indicating a potential decline in population abundance offshore.

- Modeling results, which closely track trends in relative abundance trends from the NEFSC and MA Department of Marine Fisheries surveys, indicate that the GOM stock abundance is declining and fishing mortality is increasing in recent years.

- If Maine returned to the historical long-term average of 20 million lbs, the amount of existing effort would be far too high to sustain a profitable fishery.

- Ultimately, there is no explicit goal of the limited entry system – while existing lobstermen would presumably like to see the total number of traps fished decreased, there is no set number that the state is working toward, or specific "vision" of the future of the fishery.

## 3. Discussion of the Pros and Cons of Transferability

**Key Findings:**

Free market license transfers have created socio-economic issues in jurisdictions in which this approach has been applied. These include a high cost of license transfers (e.g. up to $15,000 in NH and $750,000 to $800,000 in parts of Canada); barriers to entry to younger people due to cost; and licenses being sold away from smaller communities. Intra-family transfers of licenses create issues such as restricting access to existing fishing families, difficulties of enforcement, and uncertainty of asset value to existing license holders when they retire or want to exit the fishery.

Trap transfer provisions have proven to be an effective mechanism to reduce trap numbers in jurisdictions that have applied them, e.g. Massachusetts, Florida, and Western Australian. However, in at least one jurisdiction (Florida), under-reporting of transfers has been a major problem resulting in substantial revenue loss.

The current limited entry system in Maine does not allow for transferability of either licenses or trap tags. This policy has clearly resulted in issues and concerns surrounding the ability of fishermen to both enter and exit the fishery that are well documented in the 2012 License Holders Survey results in this report (Appendix D and E). These issues and concerns are almost exclusively of a socio-economic nature and do not address biological conservation concerns. The information presented in this section on transferability has been mostly gleaned from other jurisdictions, as detailed in Appendix G.

The pros and cons of allowing transferability of licenses and trap tags, both in a free market and within families, are summarized below. These have been largely based on experiences in other jurisdictions and the personal experiences of the authors.

### 3.1 Transferable Licenses

*Free Market Transfers*

Free market license transfers generally provide for no constraints on transferability, and the negotiation, purchase and sale are often handled outside of a formal licensing system. However, documentation can be submitted to the state to record details of the transfer.

- NH licenses have been transferred on the free market for values of up to $15,000 for commercial licenses with 1,200 traps. Canadian license transfers, have fetched upwards of $750,000 to $800,00 each in 2008 when lobster prices were high (S. Leslie, pers. comm.). This figure is often more than what young fishermen can afford.

- In the Massachusetts fishery, the catch rates in LMA 1 have been low with marginal profit levels and the cost of purchasing a permit averages around $10,000. The Outer Cape Cod fishery has experienced higher catch rates and higher profitability and permits have cost upwards of $75,000, but few permits have been transferred.

- Massachusetts engages in a review of historical landings, and establishes minimum landings requirements and landings frequencies (e.g., must have fished four out of the past five years and landed a minimum of 1,000 lbs. of lobsters or had a minimum of 20 landings) for individuals who wish to transfer a commercial lobster license.

- Based on these and other experiences, the pros and cons to consider with free market license transfers include:

**Table 18: Pros and Cons of Free-market license transfers**

| Pros | Cons |
|---|---|
| Allows for economic efficiency | Results in high values being placed on license purchase |
| Allows for entry/exit to/from the fishery | Results in increased difficulty for all individuals, and especially younger people, to enter the fishery due to cost |
| Provides an asset value to the license holder when they want to exit or retire from the fishery | Can result in licenses being sold out of the community to the highest bidder |
| Ownership of a transferable fishing license generally strengthens sense of stewardship | |

*Within-Family Transfers*

Within-family transfers, allow intra-family transfers of commercial licenses and often include restrictions on the transfer direction (i.e. father to son, not vice-versa).

- The restriction of transfers to family members only has not been observed in other jurisdictions. Concerns regarding the fairness of such a potential policy in the Maine lobster fishery was expressed in the outreach phase of the project.

- In Massachusetts and Canada, there are provisions for both family and free market transfers. In Massachusetts, transfers to immediate family members are allowed that do not meet the minimum landings requirements for free market transfer. Immediate family members are defined as the legal father, mother, wife, husband, sister, brother, son, daughter, or grandchild of the permit holder (in the direct line). In Canada, the legal construct of transferring "controlling interests" is used to direct a transfer to a desired recipient, and enables within family designations.

- The pros and cons to consider with intra-family license transfers include:

**Table 19: Pros and Cons of Intra-family license transfer restrictions**

| Pros | Cons |
|---|---|
| Allows for entry/exit to/from the fishery | Does not provide for new entrants from outside of existing fishing families |
| Allows for the "family business" to be passed down through the family upon retirement or death | Difficult to enforce |
| Supports the goal of maintaining the economic viability of local fishing communities. | Does not necessarily provide an asset value to the license holder when they want to exit or retire from the fishery |
| | May cause negative public comment and challenges to the fairness and or legality of the policy |

### 3.2 Transferable Trap tags

*Free Market Transfers*

- Trap tag transferability programs are in use in some jurisdictions and trap fisheries, such as the Florida spiny lobster fishery, the Outer Cape Cod lobster fishery in Massachusetts, and the majority of the Gulf of Maine Lobster Conservation Management Areas, with the exception of Area 1, which encompasses the Maine lobster Zones.

- In the Outer Cape Cod fishery, trap transferability is allowed subject to trap transfer "taxes" (a reduction of 10% in trap numbers applied to any trap allocation transfer transaction between fishermen when transferring permits). Dual state and federal permit holders who transfer the federal permit may lose their state trap allocation. Trap transfers in the Outer Cape Cod fishery has cost from $25 to $200 per trap transferred.

- In the Florida fishery, trap transferability is allowed with a transfer fee ($2 fee for administrative costs and a 25% surcharge of the fair market value, whichever is greater, charged the first time a trap is transferred outside the original holder's family) charged per trap transferred. When certificates are transferred outside the immediate family of the original certificate holder, the number of certificates is reduced by 25%. No person, firm, corporation, or other business entity is allowed to control more than 1.5 % of the total available certificates in any given year. Under-reporting of certificate transfers/sales has been a major problem with the program, resulting in substantial revenue loss to the state.

- An example of a tier license with transferability is seen in the California Dungeness crab management program, which is transitioning to a seven-tier license structure with free market trap transfers, but officially recorded by the state.

**Table 20: Pros and Cons of Free-market Trap Transfers**

| Pros | Cons |
|---|---|
| Allows for entry/exit to/from the fishery | May result in accumulation of trap tags by individuals |
| Helps to reduce overcapitalization and allows for economic efficiency | Can result in trap tags being sold out of the community to the highest bidder |
| Allows fishermen to adjust their trap numbers to an optimal level for their operation | Can result in escalating values being placed on trap tag purchase |
| Provides an asset value to the license holder when they want to exit or retire from the fishery | Increases complexity and cost of enforcement due to changing number of trap tags for individual fishermen |
| Provides the capacity to deal with in-season variability in abundance to maximize economic returns | Under-reporting of trap transfers can be a major problem resulting in substantial revenue loss |
| Provides a mechanism to reduce trap numbers through the inclusion of a "conservation tax" that requires a trap retirement at each trap transfer | May result in accumulation of trap tags by individuals |

*Within-Family Transfers*

Within-family trap tag transfers are those whereby only intra-family transfers are allowed.

- The restriction of trap transfers to family members only has not been observed in other jurisdictions. In Maine we heard concerns regarding the fairness of such a potential policy in the Outreach phase of the project.
- The transfer among family members is accomplished in both Massachusetts and Canada, but as a component of an overall business transfer with complete assets, and not necessarily restricted to family only.

**Table 21: Pros and Cons of Intra-family Trap Tag Transfers**

| Pros | Cons |
|---|---|
| Allows for entry/exit to/from the fishery | Does not allow for economic efficiency |
| Allows for the "family business" to be passed down through the family upon retirement or death | Does not necessarily provide an asset value to the license holder when they want to exit or retire from the fishery |
| Supports the goal of maintaining the economic viability of local fishing communities | May increase complexity and cost of enforcement due to changing number of trap tags for individual fishermen |
| Provides the capacity to deal with in-season variability in abundance to maximize economic returns | |

## 3.3 Maine Specific Considerations regarding transferability:

The findings from the 2012 License Holders Survey shown in Figure 28 indicate that 61% of current license holders favor transferability of licenses, tags or both. Conversely, 35% of current license holders do not favor transferability at all.

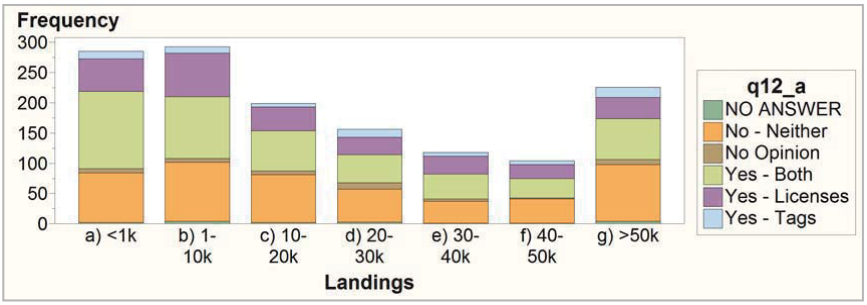



**Figure 29: 2012 License Holders Survey responses to question #12 "Do you believe that licenses and/or tags should be transferrable?"**

The 2012 License Holders Survey responses to question #14 also indicate that 64% favor restrictions on transfers, which are either Intra-Family Direct, or Intra-Family Distant Relations, and 26% favor restricting transfers within a zone. From the outreach meetings, we also heard that

roughly half of the fishermen feel that any type of transfer should not result in market-based pricing, and should be mediated through a state process.

## Objective IV: Options for Consideration and Their Potential Impacts

In the preceding sections of this report, we evaluated the impact of the Maine limited entry lobster licensing system on the number of license holders and total fishing effort over the past 15 years. Through our evaluation, we identified a series of key issues and reviewed management measures adopted by other jurisdictions with similar fisheries.

The specific issues identified in the report include:

- High level of latency (idle licenses and trap tags which could be immediately activated and therefore present a high degree of risk to the resource);
- Lack of a cap on fishing effort and insufficient resource management tools to address future changes in abundance;
- Social equity concerns around fair access to the lobster fishery as a public resource;
- Market constraints, which negatively impact lobster price and fishermen's operating income, as a function of increased landings.

In this section, we present three management options for the State of Maine to consider as the means with which to address the key issues identified in the evaluation. A preliminary overview of the potential economic impacts of each option is also included. These management options should not be considered exhaustive or prescriptive. We recommend that any new system should be developed in close collaboration with industry after a thorough vetting of the findings in this report.

The management options were designed with a three to five year outlook, and selected based on the feedback received from the Maine lobster industry and other interested parties throughout the license evaluation process. Through the 2012 License Holders Survey we found that more than 95% of both current commercial license holders and non-license holders feel strongly that quotas on pounds landed should not be used as a method to control effort in the lobster fishery (Figure 28), and so this option has not been presented here.

Through the 2012 License Holders Survey, the outreach meetings, and the discussions with the Working Group, we solicited feedback on goals to consider when offering changes to the lobster management system (Appendix H). Overall, we found a desire to maximize the participation in the fishery without increasing the number of traps in the water, and a desire to ensure the long-term health of the resource. Additional goals include:

- Allow for efficient exit & entry to the fishery;
- Enable effective resource management;
- Provide for regional flexibility and decision making; and
- Ensure coastal communities retain and foster productive economies.

We heard advice from other jurisdictions of the importance of owner-operator provisions as a means of preserving the fishing communities' character, and from fishermen we heard a desire for transferability as a way to redistribute the fishing effort, especially among families, provided

that transfers do not result in high priced licenses or tags. Lastly, each lobster zone has unique requirements and different economic considerations, and so we were cautioned against statewide options that do not provide for regional flexibility and decision-making as a critical element.

The development and implementation of any new system in Maine will require a series of steps, each with their own decision-points. We first outline a phased approach that describes a process for change and identifies several options and considerations for each stage. Following the description of the phased approach, we explore three options more fully and identify how these system changes might be recombined to yield a unique solution for Maine.

## 1. Decision-points in a multi-year, phased approach

***Years One to Three:***
*Develop a Fishery Management Plan (FMP)*

> Undertake the development of an FMP for Maine lobster that establishes thresholds and benchmarks and thus defines management of the lobster resource, particularly in the event of a decline in abundance. Establish goals and a vision for the fishery as a collaborative process with industry stakeholders.

*Ease tensions and create more exit-to-entry movement*

> During our evaluation process, we identified a series of social concerns and perceptions of unfairness, and while the data refute some of the common assumptions, the perceptions are nonetheless important to address. DMR can pursue discussion with individual zone councils, and lobstermen individually, as well as make some modifications to the inputs to the existing system to address the question of perceived fairness.

*Ensure robust landings records*

> Through an open and public process, establish baseline landings histories using a retrospective view for all lobstermen. Ensure accuracy and ultimately strive for synchronization with Federal data. Ensure that there is an appeals process for all inquiries, and that the histories are maintained annually.

***Years Two to Five:***
*Set cap on total fishing effort*

> Based on the FMP development process and with the harvest targets and minimum thresholds in mind, begin to address latency with a goal of setting a cap on traps at a level no greater than today's total actively fished level of traps, and possibly significantly lower in the future if needed and as determined by the longer term FMP effort. Once latent trap tags have been reduced, they can be 100% permanently retired to establish a total cap on number of trap tags, by zone. This can be done by one or more of the following methods:

- Increase the cost per tag as number of total tags purchased increases to encourage fewer trap tags purchased;
- Develop a series of new license tiers with varying numbers of trap tags, set thresholds for each tier by zone, and place individuals into tiers based on landings history;
- Develop a new commercial license category with limited or no trap tags, for those who have no landings history, or low landings history;
- Suspend licenses with no landings history, or below a minimum threshold, in the past three out of four years;
- With transferability, facilitate an industry buy-back of trap tags to significantly reduce overall number of tags, and decrease latency. Do not change maximum trap numbers but impose a one-time proportional trap tag retirement, equally shared by all active and latent license holders, and enable a transferrable tag system so active fisherman can build back up to the maximum of 800 traps as a result of purchasing tags from others who are willing to sell.

***Years Three to Five:***
*Enable movement of effort within the system*

With either a tiered licensing system and/or transferable tags, existing license holders can be offered opportunities to move within effort levels by one of two ways (choose one):

- Annually *re-qualify everyone for their current tier*, allow upward movement for those who have fished at the maximum of the tier for 2 consecutive years, and impose downward movement for those who have fished below the minimum for 2 consecutive years; or

- Create a *tag transferability* mechanism after setting baselines, accumulation limits, and zone allocations. Allow individuals to identify a seller and tags they wish to purchase; perform transaction via a DMR-approved procedure. Impose a conservation (tag reduction) provision on tag transfers.

New entrants can access the fishery through the mechanisms below:

- Continued use of waiting lists and minimum 1:1 entry-to-exit provision;
- Issue a new license in a low trap tag tier, seeded from State tag pool, and build up through annual re-qualification (i.e., Student Program);
- Issue a new license without any tags, and acquire tags through transfers;
- Acquire another fisherman's business and license, with prior fishing experience required, and owner-operator provision enforced; or
- Acquire a license and business assets from direct family (father/son, siblings).

***Years Five and Beyond***
*Consider Output Controls - Five Years and Beyond*

> Many jurisdictions have found that an output control system provides greater management of the resource, improved market control, and improved cost recovery for government. Maine must explore this option carefully, in connection with the development of the FMP.

## 2. Specific Scenarios and Potential Economic Impacts:

We have provided a few scenarios below to help decision-makers understand the potential impacts. These are provided as directional impacts, as it would be very difficult to provide absolute impacts given the vast number of variables and unknowns, especially by region. Each of the scenarios below has been evaluated along a series of criteria specifically articulated by DMR, and include:

- Efficacy of system in admitting new entrants;
- The effect of system on latency;
- Ramifications on fisherman age structure.

As well as potential other & economic impacts:

- Maine's coastal communities and economy;
- The profitability of existing lobster license holders;
- The opportunity for entry into the fishery by young people; and
- The lobster resource (in cooperation with the State Biologist).

We provide three scenarios for consideration for the upcoming three to five year time horizon: Status Quo, Modified Limited Entry, and Tiered Licensing. As a further management measure to explore four to five years in the future, we outline an Individual Transferrable Trap Tag program (ITT).

### *2.1 Status Quo*

The evaluation phase for the existing limited entry system has provided insights into what is currently working, and what is currently not working as detailed in the above report. During the Outreach phase, we heard from many individuals that they felt the system was working as intended, and that it should not be changed. In this scenario, we consider the impact of no changes to the limited entry system, also *assuming no immediate fundamental changes in resource abundance, or changes in the overall market demand for lobster.*

***Basic Description***

Continue with current limited entry system, as is, no changes.

***Overall Potential Impact***

- The number of new apprentices enrolled each year will exceed the number of individuals who are issued a full commercial license each year. Therefore the waiting list is likely to continue to grow, although some people will continue to give up due to lengthy wait times.

- The exit rate is likely to remain the same at between 2-4% for at least another 10 years.

- Based on the historical number of tags released each year, under current average exit rates and ratios (since 2009), we estimate that the system will continue to enable entry for an average of 62 new entrants per year statewide. On a regional basis, however, we expect that at least one third (21) of the new licenses will continue to be awarded in Zone C, and the other two thirds (41) among the remaining 6 zones, or 7 people per zone per year, including both the student and apprentice categories.

    - The number of individuals awarded license off the waiting list averages 32 people statewide, of which 18 (more than half) are awarded in Zone C. Therefore, an average of 14 people are awarded licenses among the other six zones, or 1 to 2 people per zone, per year.

- Latency will not go away by itself over time. Many jurisdictions, including California, report as much as 30% latency and have observed build-up behavior on the part of fishermen in response to potentially changing regulations.

- Current entry policies, which enable direct entry for Students under 18 (Figure 4), will continue and eventually create a very young fishing cohort, of smaller size.

***Potential Other Social and Economic Impacts***

- As we saw through the evaluation of the limited entry licensing system in previous sections of the report, fishing effort is not effectively constrained, and operates as a regulated open access fishery. As we saw in Objective I of the report, fishermen in Maine continue to pursue the lobster resource by increasing other aspects of fishing effort, such as vessel size, number of times traps are hauled per day, number of crew, and new technology, such as GPS locators. This increase in fishing effort and equipment or "capital stuffing" is likely to continue under the current limited entry system.

- Restricting the number of vessels or individuals fishing should not be expected to reduce the pressure on the resource, or improve the profitability of the fishery, if other aspects of fishing effort are not also managed.

- The opportunity for entry into the fishery by young people would not be affected.

- The social equity tensions are likely to persist, and even escalate. Indications from the outreach, phone calls, and testimony provided through the Maine Regulatory Fairness

Board (Appendix H), suggest that many individuals on the waiting list and within fishing communities feel unfairly excluded from accessing a healthy public resource and are willing to take action, including legal recourse, to effect change to the current limited entry system.

## 2.2 Modified Limited Entry

The evaluation phase for the existing limited entry system has provided insights into what is currently working and what is currently not working as detailed in the above report. Many suggestions were offered for how to improve the existing system, without completely abandoning it. In this scenario, we consider the impact of a variety of changes identified as ways to ease tensions, and provide for enhanced local economic return in the short-term, *assuming no immediate fundamental changes in resource abundance or changes in the overall market demand for lobster.*

***Basic Description***

Three minor adjustments, which can be implemented either individually, or as a combination of one or more, include:

- *Adjust the method for counting total tags exiting the zone*. When a license holder retires, calculate the number of trap tags leaving the system based on a maximum number of tags issued to the exiting license, rather than the number issued in the final year.

- *Work with each limited entry zone to revisit their exit ratio*. Zone councils have in the past individually revisited exit ratios, and the Commissioner can collaborate with each council and provide an analysis of the impact of the exit ratio for the zone councils to consider. Based on the outreach meetings, phone calls and comments from lobstermen, some zones may be more open to admitting more entrants at a measured pace appropriate to the zone.

- *Set a maximum post apprenticeship waiting time of five years*, <u>for the next 5 years *only*</u>, and then revisit the policy.

***Overall Potential Impacts***

- Any one of these options would immediately help improve the efficacy of the system in admitting new entrants, and does not create an irrevocable or tradable new asset, or property right. The impact of the small changes cited are evaluated individually below:

    a. Establishing a maximum waiting period of five years would allow for approximately 100 new entrants in the first year, and approximately an additional 40 entrants each year for the next four years, spread across six of the seven zones, or approximately 6 people per zone. For comparison, Zone C, which does not have a waiting list, has allowed an annual average entry of 18 new commercial

license holders each year (roughly twice the average found in other zones), and continues to see 50 to 100 new apprentices, and an equal number of new students each year.

b. Adjusting the exit-to-entry ratios from 5:1 to 3:1, for example, in all limited entry zones, would double the number of new entrants, allowing approximately 30 new entrants per year, versus 14 under the status quo; going down to a 1:1 ratio, for example, would allow approximately 5 times as many new entrants, or 70 new entrants per year.

c. Adjusting the trap tag exit calculation methodology from the most recent number of trap tags, to the maximum number of trap tags issued would provide for an additional 27% new entry. At current exit-to-entry ratios, this would allow an additional four people per year. At a 1:1 exit-to-entry ratio, this would allow an additional 15 individuals entry each year.

- With additional entry, exiting latent license holders may have greater opportunities of recovering some of their investments through sale of capital assets (boats, gear) along with wharf access, bait and fuel supply chains, and coop connections. However, latent licenses and trap tags are not likely to decline significantly without the use of other measures.

- Licenses retain their current intent as a privilege to access a public resource and there are no permanent awards of harvest rights.

- There would be an increase in the number of individuals in the age range from 25 – 45 entering the fishery (based on age of individuals currently on waiting list), which is the group with the least number of fishermen in the current system today.

- The tensions associated with not admitting new entrants must be balanced with the tensions associated with additional effort on the water. This type of question is best handled individually by each Zone, and with the help of a neutral facilitator.

***Potential Other Social and Economic Impacts***

- The immediate release of pent up investment would provide a short-term boost to local economies, as a group of individuals are able to obtain a license (e.g., widows, heirs, returning grads, etc.) and purchase vessels and gear.

- Impact on profitability of existing lobster license holders is difficult to predict, but this option does have the potential to redistribute the harvest in areas with high densities of fishing effort, as opposed to creating new incremental income opportunities – and therefore negatively impact profitability of existing license holders.

- The opportunity for entry into the fishery by young people would not be affected.

- Given the market and the current constraints on product demand, additional lobster product landed is likely to negatively impact overall prices, and have a negative impact on individual profitability.

- The large degree of uncertainty associated with current resource exploitation rates by zone make it difficult to predict the impact of this level of additional harvest on the resource. From the outreach meetings and calls, current fishermen in Zones A, B, and C do not feel that maximum rates have been achieved, although there was significant concern over gear density, especially in the near-shore fishing areas. However, in Zones D, E, F, and G, a great amount of concern has been raised over the current potential for over-harvest.

- Any substantial concerns for the biological conservation of the resource identified throughout the report will not be addressed by the current limited entry system, or further effort limited entry restrictions, as observed in other jurisdictions such as Western Australia, South Australia, and New Zealand.

### 2.3 Tiered Licensing

The outreach meetings conducted reflected a very strong interest in providing flexibility for fishermen to build up or build down, based on age and business strategy. A viable option, familiar to Maine lobstermen as a result of a 2008 Lobster Advisory Council Task Force effort, is a four-tier license structure, in which current license holders are sorted into tiers based on landings histories and tag sales, and with a mechanism for individuals to move between the tiers. A similar system has been developed in the California Dungeness Crab fishery, as a result of an industry-based task force.

***Basic Description***

- *Current license holders would be sorted into appropriate tiers as a mechanism of the annual license renewal process*. Initial determinations of eligible trap tags would rely on information from both trap tag sales and four-year mandatory dealer landings information from 2008 to 2012.

    - Tiers are best set at the zone level, where each zone is different in its composition of landings. Jurisdictions who have undertaken similar efforts, such as California, used a five-year time period to develop their tiers.

    - Maine's mandatory dealer reporting, which began in 2008, may have potential gaps and inconsistencies, and also does not reflect private sales of lobster. Therefore, initial tier assignments may be contested by affected individuals, but the four-year history from 2008 to 2012 can be summarized and each fisherman notified about his or her trap tag eligibility.

- *Develop and implement an independent appeals board*. Appeals become an important mechanism for the resolution of tier placement issues, data discrepancies, and other

individual considerations such as military service and medical appeals. An independent three-person review panel can serve this role in a neutral fashion. A fee may be applied for appeals requests, to cover the costs of this administrative service. To arrive at the appropriate fee, jurisdictions have estimated their total costs and then worked backwards to arrive at individual costs.

- *Annually determine how many tags were retired in a zone from individuals who did not renew their license and admit new entrants into the system*. Once existing license holders have been sorted into tiers, DMR can annually determine how many tags were retired in a zone from individuals who did not renew their licenses. The zone exit ratio can be applied to the retired tags to determine how many individuals can be allowed to enter the zone to maintain the total cap on fishing effort. New entrants can be admitted at the low tier, with the opportunity to move up in the tiers over time (see below). The number of individuals who initially qualify for the top level of effort can provide the cap on the number of licenses that will be issued in the future in that tier, i.e., a top tier license will need to be retired before a new one is issued; lower tiers may not require a waiting list, but this can be determined periodically, and altered as needed.

    - In Rhode Island, a priority scheme allows for the fulfillment of annual new entrant requests. Priority considerations are offered for crew years and percent of income derived from the fishery in the two years preceding new license application.
    - The Alaska Halibut fishery implemented a points-based system, and derived the priority scheme with the involvement of local fishermen and communities to adapt with the communities' values over time.

- *Develop and administer a method for transfer within tiers*. An individual who wishes to move up in effort must operate at the maximum of the lower tier for two consecutive years to be eligible for a tag increase. To retain active status within certain tiers, a minimum landings level must be maintained, or the license automatically drops to the next lower tier. Individuals may opt to fish any tier lower at any time.

***Overall Potential Impacts***

- Assists with maintaining the traditional structure of Maine's lobster industry and provide flexibility to the fishery.

- Immediately improves the efficacy of the system in admitting new entrants.

- Does not create an irrevocable or tradable new asset, or property right.

- Reduces the impact of latent license holdings and trap tags by awarding trap tags as a function of historical landings.

- Over time, the age structure would over time reflect the natural variations of the population of fishermen.

***Potential Other Social and Economic Impacts***

- We used current 2011 landings data to estimate the impact of sorting fishermen into tiers, and estimate that we would see the total number of license holders remain unchanged, and the total number of tags reduced by about 326,000 tags, or an 11% decrease from the total number of 2011 trap tags issued.

| | | Trap Tag Change | # People |
|---|---|---|---|
| No Landings | Eligible for 150 tags | - 222,492 | 1,107 |
| Up to 10,000 lbs. | Eligible for 400 tags | - 81,464 | 1,270 |
| Up to 30,000 lbs. | Eligible for 600 tags | -22,017 | 1,218 |
| All others >30,000 lbs. | Eligible for 800 tags | N/C | 1,337 |
| Total Change | | -325,973 | |

- Based on profitability estimates for the landings categories, this would not have a revenue impact on fishing communities or individual fishermen.

- The opportunity for entry into the fishery by young people would not be affected.

- A tiered license system would establish a total cap on effort, as measured by number of trap tags, yet maximize participation at the same time.

## 3. Additional Management Tools for Consideration:

Individual transferrable trap tags provide a mechanism for redistributing fishing effort once an overall cap has been established. This can be used in conjunction with the other options provided, or as a stand-alone once latent effort has been addressed. Transferability alone does not necessarily provide enough structure to constitute a licensing system by itself. It serves as a mechanism for re-distributing effort in the fishery, once it has been capped.

***Basic Description***

- Once effort has been capped at some existing agreed upon total number of tags, and latent effort has been mitigated or eliminated, then a system of transfers can be considered.

- Individuals with tags available and those seeking tags can identify each other through family, friends, community networks, word of mouth, etc., and negotiate the transfer of tags between them. Once an agreement has been made, a bill of sale is created and presented to the DMR, which approves the transaction.

- As a means of reducing effort, other jurisdictions have opted to charge a ten percent tag retirement provision on each transfer, where these tags are permanently retired upon transfer.

- Limits on the number of transfers, or frequency of transfers, can be considered to avoid fraudulent practices.

- Evaluate the ASMFC Addendum XII transfer program description to ensure that state and federal processes are coordinated to prevent a common pitfall: state and federal lobster fishery managers have identified the problems of "permit splitting" where effort proliferates when a single fishing operation, dually permitted by a state and NMFS, could create a doubling of effort by shifting the state permit to a second vessel while the federal permit remains intact on the original vessel.

- If a goal of across-the-board trap reductions is desired in the future, the State can create an industry buy-back program, similar to the effort underway in Massachusetts Outer Cape fishery. In this plan, the State will impose a set reduction (of 30% of traps for example) for all license holders, including latent license holders. Once this reduction has been enacted, industry members who wish to build back up to the maximum total allowable number of traps, can purchase these tags from other license holders. The ten percent tag retirement provision and other aspects of transferability still apply.

***Overall Potential Impacts***

- Transferability of tags alone does not enable new entrants, but it provides a mechanism for new entrants to scale up once they have obtained a license.

- Largely, jurisdictions which have offered transferability have reduced latent effort in advance of such a change, or limited the transfer of inactive tags through eligibility restrictions.

- Once implemented, transferrable tags can reduce latency over time, because new trap tag holders tend to be more active in the fishery as a way to repay the purchase price.

- Transferability has been shown to have relatively little influence on fisherman's age structure.

***Potential Social and Economic Impacts***

- Once transferability has been introduced, it cannot be rescinded. Other jurisdictions which have allowed for either transferability of trap tags or licenses have found that certain measures such as owner-operator provisions, or "boots on deck", have been critical to retaining the character of the coastal fishing communities, but not always entirely effective without enforcement.

- The open-market value of a license or a tag has been found to scale with the potential business return, as in Massachusetts and Canada for example, and in some cases this has exceeded the buying power of individuals in the community; over time the trends show that trap tags transferred this way will go to the highest bidder, potentially negatively impacting the coastal community by shifting the effort out of the region.

- State Managers have indicated that the burden of effecting transfers has not been significant, as only a small percentage of transactions (i.e., 30 or so per year or three percent of the total number of licenses) take place each year (D. McKiernan pers. comm) and of these transfers 30% are direct family transfers effected with a simple authorization letter. Within the trap transfer category, even fewer transfers take place each year, stemming largely from low levels of overall latency.

- The availability of trap tags provides more access opportunities to the fishery, but the profitability of existing lobster license holders can be negatively impacted with the added burden of repayment, and the possibility of bankruptcy associated with poor business decisions must be considered.

- The opportunity for entry into the fishery by young people may be negatively impacted, as young people are not financially able to bear the added costs.

- The transferred trap tags tend to be more actively fished by the new trap tag holder than the previous trap tag holder, and therefore the impact on the lobster resource may be higher than systems without transferability.

## Report Conclusions

Since 1997, the number of all licenses type declined statewide by 12%, but the number of tags increased by 13%. Zones E, F, and G have seen LC1, LC2 and LC3 license reductions approaching the less than 30% of tags in 1997 target set in 1999. Zones A and C have seen modest increases in licenses number – nine and two percent, respectively. However the number of tags, not licenses, is a more accurate measure of effort.

Scientific and industry consensus suggests that the number of traps actively being fished is near the maximum for the resource and gear density. As well, both the Atlantic States Marine Fisheries Commission (ASMFC) and existing fishermen have expressed concern over the latent tags. There remains the potential for 39% immediate increase in fishing effort if all latent tags become active. However, some suggest that certain zones could shift to a 1:1 exit-to-entry ratio as tags are retired going forward, while the larger issues cited are addressed. Data about waiting list members suggest that many are either already fishing (likely as crew), plan to take over a family business, or want to fish part-time. This suggests that only a portion of waiting list members would represent significant new effort on the resource.

The current student license program allows ample opportunity for those who satisfy the criteria of the program. However, relatively few students convert to full time commercial fisherman, suggesting that other factors limit opportunity. In addition, surveys show fishermen believe the student program should be kept and that it continues to be an important element for communities. However, social equity concerns have been raised as a result of the policy that allows students to by-pass the long line of apprentices and others on the waiting list. We now see that over half of the people on the waiting list are 36 or younger, which suggests regional economic cost associated with excluding these individuals from the fishery.

With high exit-to-entry ratios, latent tags keep new entrants out by remaining on the books. Latent licenses and tags pose a high risk to the resource. ASMFC analysts have raised concerns about the uncertainty of potential effort. Likewise, latent tags pose a risk to current fishermen. If inactive tags became active traps, they would have an impact on individual earnings, especially in high-density fishing areas. Fishermen with zero landings are different than those with some landings and should be addressed separately. It is hard to judge the full implications of latent licenses and tags because much depends on the intentions of the holder – some keep licenses and tags as a sense of identity, some to keep their options open, and some in the hopes of monetizing their value.

The resource has flourished under the existing system throughout much of the state, and particularly in Zones A, B, and C, where landings have climbed and lobster populations appear to be healthy. Landings have been stable or slightly increasing in all other zones. However, the current system would not adequately protect the resource if it were to become substantially depleted.

The State should develop a fishery management plan for lobster. The plan should anticipate the need to cap and eventually reduce the amount of effective effort in the fishery if resource depletion occurs. Any such approach would be highly disruptive to the industry and could only

move forward with broad industry support. Evidence from other lobster fisheries, however, suggest that limiting effort will not achieve necessary conservation goals if the resource were to decline substantially.

Based on the above findings and the experiences of other U.S. and overseas jurisdictions, it is recommended that free market license transfers not be allowed at this time, as the potential for license price increases is significant, impeding the entry of young people and causing a financial strain on fishing operations that will lead to increased fishing pressure as a way to pay back the additional costs of the license. Intra-family transfers could be considered and, based on the experience of Massachusetts, could represent a significant benefit to Maine fishing families.

Transferability should only be considered carefully and as an element of a staged approach, which addresses issues of latency in advance of any move towards transferability. Allowing license transfers has the potential to alter the characteristics of a license and suggest ownership. As well, prices paid for licenses would likely increase and could deter younger individuals and others from entry. Allowing transferable tags would add flexibility and create a mechanism for redistribution of fishing effort while reducing latent tags. Tag transferability, however, must be tied to reducing latent tag numbers, maintaining the current owner-operator provisions, and not exceeding current tag limits.

Among all the options presented and analyzed in this report, GMRI recommends the state consider developing a tiered licensing system in conjunction with industry and other key constituents. A well-designed tiered licensing system could ease existing tensions, address latent effort, and maintain the profitability of existing active fishermen – *assuming no dramatic decline in the resource or major market disruption.* Other options are worth considering, but beginning a statewide dialogue about tiered licensing would provide focus to the process the State has embarked upon with the commissioning of this report.

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## Appendices

Appendix A: Demographic and Economic Background Information for Coastal Maine Counties Based on Census Information

Appendix B: 2012 Lobster Limited Entry System Questionnaire for Existing License and Non License Holders

Appendix C: Frequency Table Results of 2012 Lobster Limited Entry System Questionnaire for Existing Holders Survey

Appendix D: Frequency Table Results of 2012 Lobster Limited Entry System Questionnaire for Non-License Holders Survey

Appendix E: Summary of 2012 Lobster Limited Entry System Questionnaire for Existing License and Non-License Holders

Appendix F: Limited Entry Evaluation Outreach Meeting Minutes

Appendix G: Lessons Learned From Other Jurisdictions

Appendix H: Synthesis from Outreach Meeting and Limited Entry System Goals Workshop Outcomes

Appendix I: Maine Lobster Laws Timeline and Management Structures 1996 - 2012

Appendix J: Sample Lobster Fishery Management Plan