

*Atlantic States Marine Fisheries Commission*

**ADDENDUM I TO AMENDMENT 2 TO THE INTERSTATE  
FISHERY MANAGEMENT PLAN FOR NORTHERN SHRIMP**



*ASMFC Vision Statement:  
Healthy, self-sustaining populations for all Atlantic coast fish species or successful  
restoration well in progress by the year 2015.*

**November 2012**

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## **1.0 Introduction**

Addendum I to Amendment 2, approved in November 2012, provides flexibility to set a hard total allowable catch (TAC), allocate the TAC by gear type (including a transferability provision), and close the fishery when a percentage of the TAC is reached to prevent overages from late and incomplete reporting. Additionally, the document establishes a set aside harvest for research and details optional gear modifications to minimize the retention of small shrimp.

Addendum I also contains an appendix of limited entry programs that were in the developmental stages when this document went out for public comment. Considering these limited entry programs were longer term management options, the intent of including them was for scoping purposes only, and no limited entry programs were implemented through Addendum I (see Appendix I). The Northern Shrimp Section (Section) made a motion at their November 2012 meeting indicating their intent to further develop limited entry through the next addendum or amendment.

## **2.0 Overview**

### ***2.1 Statement of the Problem***

Amendment 2 was developed to implement a more comprehensive and timely catch reporting system and provide the Section with several new management tools (i.e., trip limits, trap limits, and days-out of the fishery) to slow catch rates throughout the season. However, incomplete reporting and continued fluctuations in participation has led to overharvest of the TAC the last three fishing seasons. These overages coupled with a decline in stock abundance resulted in an overfished and overfishing stock status (ASMFC 2011). Given that these issues continue to jeopardize the fishery and resource, managers and stakeholders want to make adjustments to the management program that helps restore the Northern shrimp stock to maximize markets and benefits of the fishery.

#### ***2.1.2 Background***

##### **Short Term Options**

The Northern shrimp fishery is currently managed under a “soft TAC” system where overages to the TAC are not paid back the following fishing season and overfishing has occurred since 2008 as a result. Implementation of a “hard TAC” system, where overages are paid back the following year (often called “accountability measures” in other fisheries) may help prevent overfishing and makes harvesters/dealers more accountable for reporting landings on time.

The current management system provides limited flexibility for allocation of the TAC by state and/or gear. In previous fishing season, the trap and trawl fisheries have been under different management programs (e.g., start date, days out, trip limits). The flexibility of allocating the TAC by gear and or state may help stabilize effort and maximize the fisheries while also preventing them from becoming derby fisheries.

As stated, the Northern shrimp fishery exceeded its TAC in the last three fishing seasons. The current process to close the fishery requires the Section to convene a meeting or conference call and select the closure date at that meeting. Following the meeting, states need several days to

provide notice and administer the closure. Additional flexibility to close the fishery when a certain percentage of the TAC is projected to be harvested, may help to prevent such overages in the future and has been used successfully in other fisheries such as the Atlantic herring fishery.

Preliminary landings data suggest the NSTC has the ability to project a date in which landings are estimated to reach a certain percentage of the TAC. For example, in 2012, the NSTC projected that 95% of the 2,211 metric ton TAC would be landed by February 10 and 100% would be landed by February 13. Although the landings data are still preliminary, the results suggest the NSTC projection analysis was accurate.

The retention of small shrimp (<22mm) continues to be an issue for the Northern shrimp fishery. Protection of smaller shrimp enables them the opportunity to contribute to spawning stock biomass as they make a hermaphroditic transformation (changes sex from male to female) later in life. Gear modifications may be warranted if they can successfully minimize the retention of small shrimp without compromising overall catch. Burden to the fishery from any required gear modifications must be considered.

Research set asides are designed to enhance and improve our understanding of the Northern shrimp species. The current management program provides limited flexibility for setting aside a percentage of the TAC for stock and fishery research purposes.

### **Long Term Options**

The Northern shrimp fishery is currently open access and has experienced significant fluctuations in participation over the last 30 years (Table 1). Interest and participation in the fishery generally increases as the season length or price increases with many harvesters only participating as a “supplemental” fishery when other fishing opportunities are not available or economically viable.

Concern has been raised over the influx of boats into the fishery as shrimp stocks and markets warrant. Industry and managers have noted the reduced fishing opportunities for fisheries such as New England groundfish, and are concerned about the impact of this effort entering the shrimp fishery. This concern led managers to consider limited entry as a management tool to prevent transfers of effort.

The Public Information Document (PID) for Amendment 2 initially notified the public of the Section’s intent to consider development of a limited entry program. Based on public comment received on the PID and the Section’s concern regarding continuing effort increases in this fishery, the Section established a control date of June 7, 2011. The intention of the control date is to notify potential new entrants to the fishery that there is a strong possibility they will be treated differently from participants in the fishery prior to the control date.

Addendum I does not implement limited entry programs, but contained options to solicit feedback from the industry regarding potential limited entry programs that would be relevant to the northern shrimp fishery in the future (*See Appendix I*).

### **3.0 Management Options**

#### ***3.1 Total Allowable Catch (TAC) Specification***

The Section has the flexibility to set a hard TAC annually, that is associated with managing the Northern shrimp fishery,

- At the  $F_{\text{target}}$
- At the  $F_{\text{threshold}}$
- Between the  $F_{\text{target}}$  and  $F_{\text{threshold}}$

The NSTC will estimate a TAC associated with the above management flexibility using results from the most recent stock assessment.

**The methodology used to establish the TAC is described below.**

The NSTC recommends a TAC to the Section based on an assessment of current stock status, the biology of the species, and the stated management goal of protecting and maintaining the stock at levels that will support a viable fishery on a sustainable resource (Amendment 2 to the FMP, ASMFC 2011).

Catch in numbers ( $C$ ) is a function of abundance ( $N$ ) and exploitation rate ( $\mu$ , which is a function of fishing mortality  $F$  and natural mortality  $M$ ).

Using this relationship, it is possible to estimate projected landings (in numbers) for a given year at various levels of  $F$ , using population estimates and an assumption of  $M$ .

To convert landings in numbers to landings in weight, an assumption must be made about the mean weight of the shrimp caught in the upcoming fishery. The NSTC uses the relationship between the mean carapace length (mm) of female shrimp during the summer survey, and the mean weight (g) of an individual shrimp in the next fishing season, to predict the fishery mean weight.

#### ***3.2 Total Allowable Catch Allocation***

The TAC as specified in *Section 3.1* will be allocated by gear with 87% for the trawl fishery and 13% for the trap fishery. These allocation percentages were based on the recent average historical landings by gear in the Northern shrimp fishery.

#### ***3.3 TAC Transferability***

Any state can request transfer of TAC between gear types, and a transfer decision would be made by the Section during an in person meeting.

If a transfer occurs, the transfer does not permanently affect the gear allocation of the total TAC, i.e., gear-specific shares remain fixed.

#### ***3.4 Projecting Season Closure***

The Northern shrimp fishery will close when a percentage (between 80-95%) of the annual TAC has been projected to be caught. The exact percent, ranging between 80-95, and the closure notification period (2-7 days) will be established by the Section during the annual specification

process. ASMFC will notify states when the selected percentage of the TAC is projected to be reached, and states must then close their fisheries within the specified notification period.

**In projecting the season closure, the TC will consider these sources of uncertainty:**

- 1) Future catch rates, which depend on weather, stock availability, catchability, gear type, location, and fishery participation. Catch rates can be expected to be high in January and February and lower in other months, with exceptions.
- 2) Late reporting. During the 2012 season, reporting compliance improved as the season progressed.
- 3) Unreported catches due to non-compliance, or catches sold directly to retailers, consumers, or kept for personal use ("peddled"). These accounted for 11-17% of landings during 2008 through 2011.

**3.5 Research Set Asides**

The Northern Shrimp Section may establish a mechanism to set aside a percentage of TAC to help support research on the Northern shrimp stock and fishery.

A percentage of the TAC may be set aside for Northern shrimp research purposes as approved by the Section when determining the annual specification for the Northern shrimp fishery. The research set aside program will be managed by the Northern Shrimp Section and ASMFC.

**3.6 Size Sorting Grate System**

*This section replaces Section 4.1.10 in Amendment 2.*

A compound grate, or double Nordmore grate may be used by any vessel rigged for otter trawling that fishes for northern shrimp, but is not mandatory.

**Compound Grate (See Figure 1):**

The grate is a rigid or semi-rigid planar device referred to as a "Compound Grate" because it has two different sections of parallel or non-parallel bars oriented vertically (up and down).

The top section shall be configured as a Finfish Excluder Device and shall consist of parallel bars attached to the frame with spaces between the bars not to exceed 1 inch in width. A fish outlet, or hole, in the extension of the trawl shall exist forward of the cod end and compound grate.

The bottom section will allow the escape of small shrimp and will consist of parallel or non-parallel tapered bars oriented up and down with a spacing between bars of  $\frac{5}{16}$  inch to  $\frac{1}{2}$  inch (See Figure 1). The lower edge of the cod end will be attached to the grate at the juncture between the top section and the bottom section, creating a shrimp outlet similar to the fish outlet described above, that will allow the escape of shrimp that pass through the bars of the bottom section of the grate.

The compound grate also has the following optional provisions:

- This grate may be fished “upside down”, that is, with the Finfish Excluder section and outlet on the bottom and the shrimp size separator section and outlet on the top.
- A webbing funnel may be installed in front of the grate designed to direct the catch toward the grate to maximize the retention of the shrimp may be used but may not have mesh less than 1-3/8 inch stretched mesh.

**A Double Nordmore Grate (See Figure 2 and Figure 3):**

In this setup there are two separate grates,

1.) One of the grates must be a finfish excluder device (commonly referred to as the "Nordmore Grate System") and shall consist of:

- A rigid or semi-rigid grate consisting of vertical parallel bars attached to the frame with spaces between the bars not to exceed 1 inch in width;
- A fish outlet, or hole, in the extension of the trawl forward of the cod end and grate; and
- A webbing funnel installed in front of the grate designed to direct the catch toward the grate to maximize the retention of the shrimp may be used but may not have mesh less than 1-3/8 inch stretched mesh.
- Vessels fishing in the shrimp fishery shall not be allowed to possess regulated groundfish species.

2.) The other grate may be fished in front or behind the Nordmore grate. The other grate shall consist of:

- A rigid or semi-rigid planar device with vertical bar spacing of 7/16 of an inch (tolerance – must be greater than 5/16 inch but less than 1/2 inch).
- The exit holes to the cod end must be at the top and no more than 10% of the surface area.
- A funnel in front of the second grate designed to direct the catch toward the grate to maximize the escape of small shrimp may be used but may not have mesh less than 1-3/8 inch stretched mesh.

**4.0 Compliance Schedule**

States must implement the provisions of this addendum immediately upon approval of the addendum document.

**REFERENCES**

Atlantic States Marine Fisheries Commission (ASMFC). 2011. Amendment 2 to the Interstate Fisheries Management Plan for Northern Shrimp.

He, P. and V. Balzano. 2012. Improving Size Selectivity of Shrimp Trawls in the Gulf of Maine with a Modified Dual-grid Size-sorting System. *North American Journal of Fisheries Management*. (In Press)

## TABLES

Table 1. Estimated numbers of vessels in the Gulf of Maine Northern shrimp fishery by fishing season state and gear from 1980 to 2011.

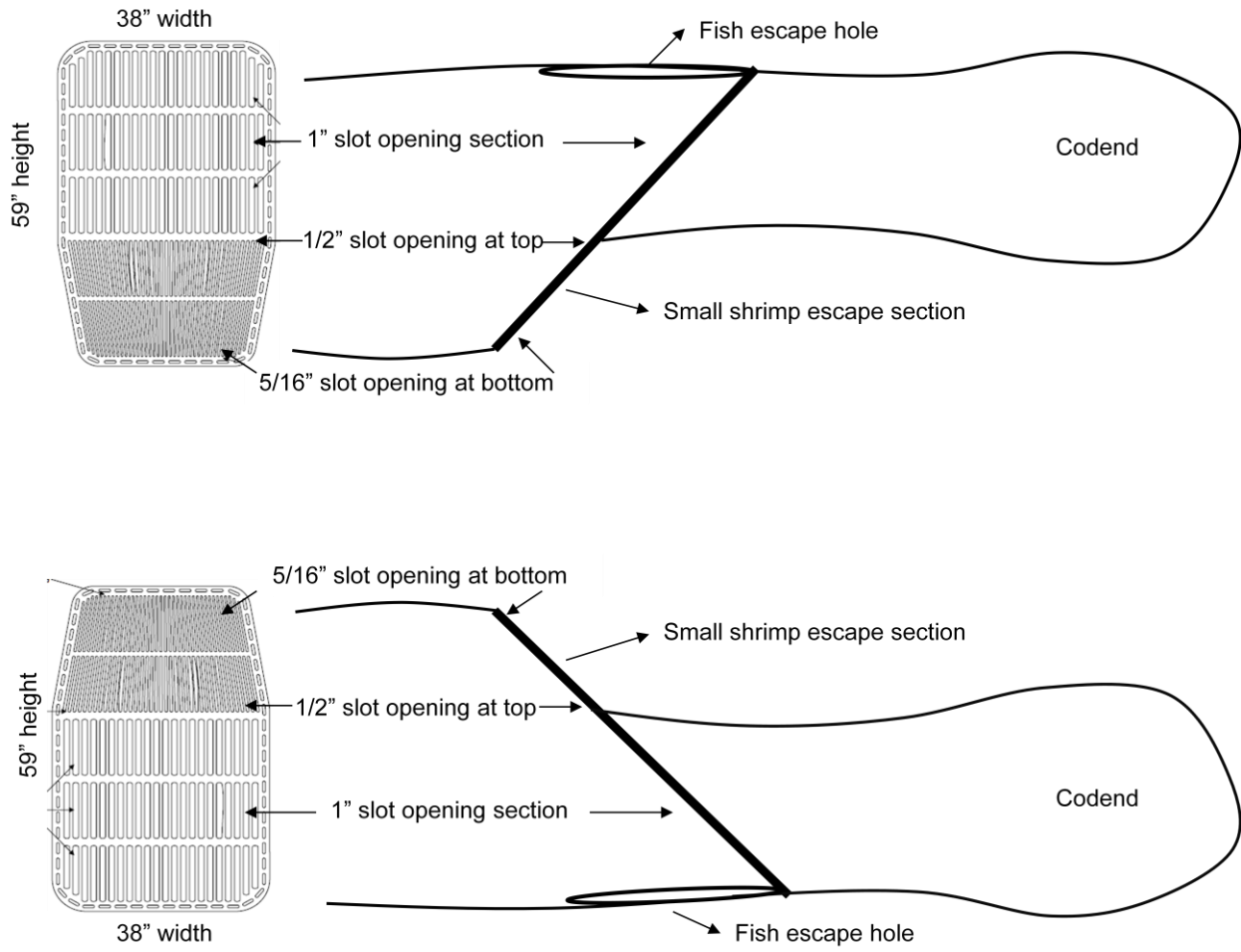
<u>Season</u>	<u>Maine</u>		<u>Massachusetts</u>	<u>New Hampshire</u>	<u>Total</u>
	<u>Trawl</u>	<u>Trap</u>	<u>Total</u>		
1980			15-20		30-40
1981			~75		~100
1982			>75		>100
1983			~164	~25	~197
1984			239	43	288
1985			~231	~40	~300
1986					~300
1987			289	39	345
1988			~290	~70	~390
1989			~230	~50	~310
1990			~220		~250
1991			~200	~30	~250
1992			~259	~50	~325
1993			192	52	273
1994			178	40	247
1995					
1996			275	43	347
1997			238	32	311
1998			195	33	260
1999			181	27	238
2000			249	15	287
2001	174	60	234	19	275
2002	117	52	168	7	198
2003	142	49	191	12	222
2004	114	56	170	7	192
2005	102	64	166	9	197
2006	68	62	129	4	144
2007	97	84	179	3	196
2008	121	94	215	4	234
2009	80	78	158	12 (MA and NH combined)	
*2010	123	112	234	5	254
*2011	156	125	276	12	308

note that some boats reported both trapping and trawling

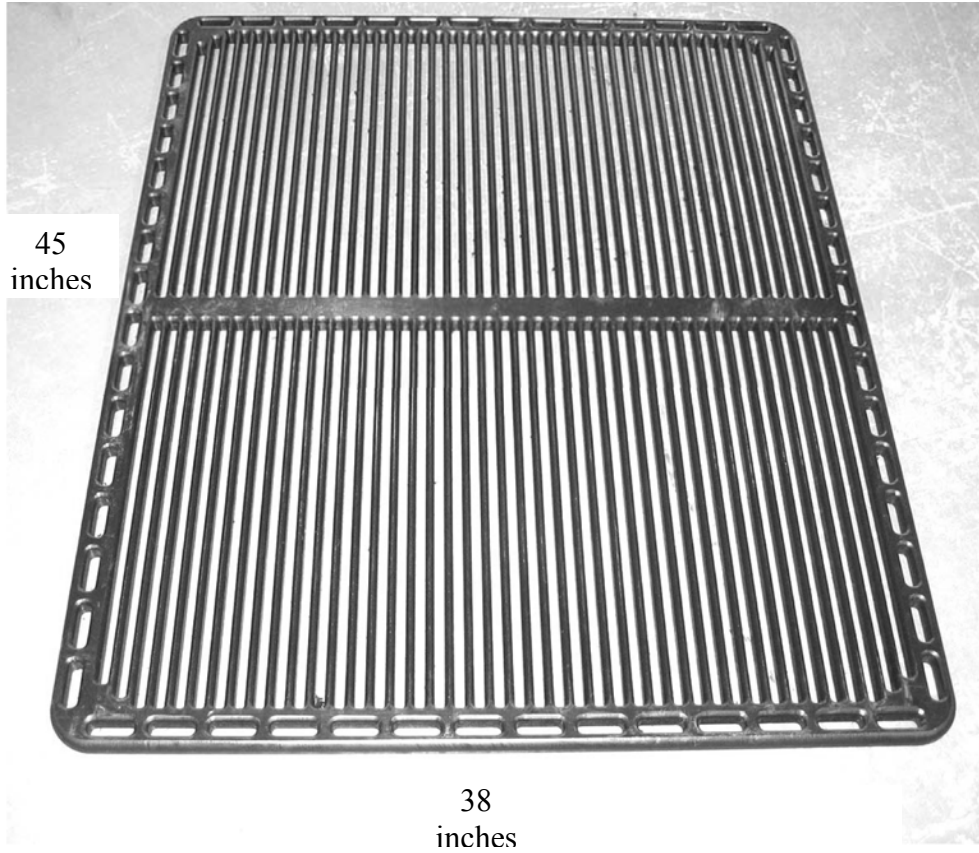
\* preliminary



**FIGURES**



**Figure 1. Schematic diagram of the compound size sorting grate to minimize the retention of small shrimp. The top panel diagrams the small shrimp size sorting section of the grate at the bottom (ventral) side of the net. The bottom panel diagrams the small shrimp size sorting section of the grate at the top (dorsal) side of the net.**



**Figure 2. Recommended size-sorting grate for the double Nordmore grate configuration (He and Balzano 2012).**

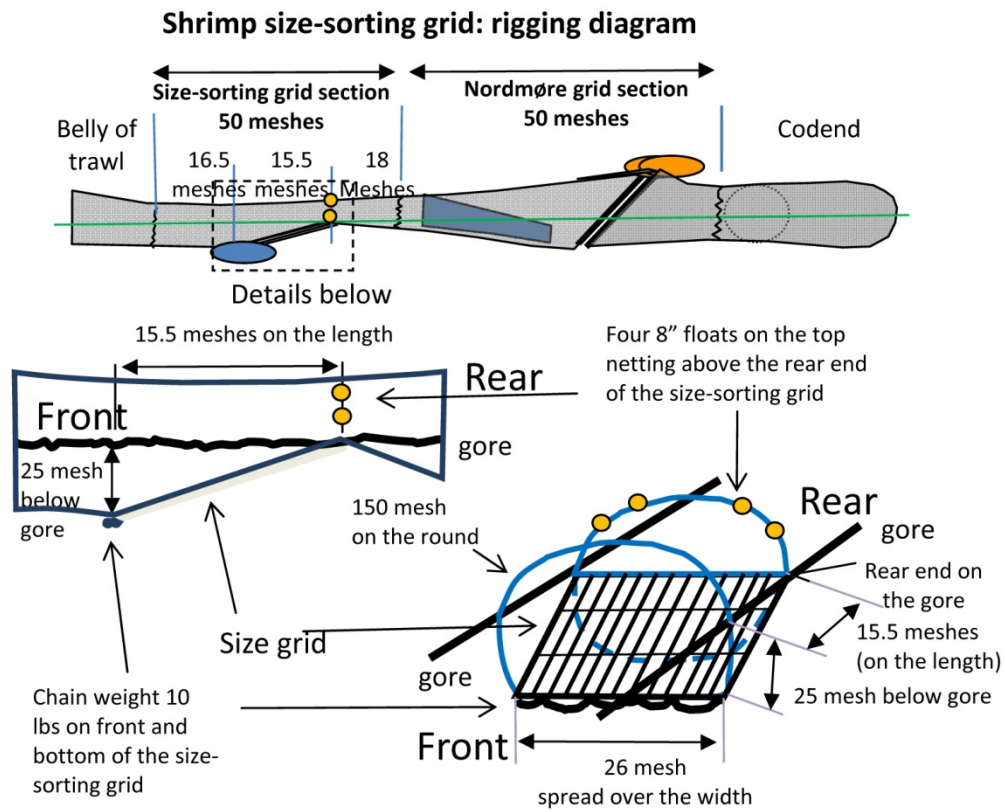


Figure 3. Shrimp size-sorting grid: rigging diagram (He and Balzano 2012).

## ***Appendix 1: Scoping of Limited Entry Programs***

The Public Information Document (PID) for Amendment 2 initially notified the public of the Section's intent to consider development of a limited entry program. Based on public comment received on the PID and the Section's concern regarding continuing effort increases in this fishery, the Section established a control date of June 7, 2011. The intention of the control date was to notify potential new entrants to the fishery that there is a strong possibility they will be treated differently from participants in the fishery prior to the control date.

It is important to note that Addendum I will not implement limited entry programs for the 2012/2013 fishing season, but does solicit feedback from the industry regarding potential limited entry programs that would be relevant to the northern shrimp fishery in the future.

Option A. Status quo, the Northern shrimp fishery remains open access.

Option B. Limited entry should be considered in the Northern shrimp fishery.

*If selecting Option B, the Section is looking for feedback on limited entry approaches in Section 3.8.1 and 3.8.2*

### **3.8.1 Fixed Percentage Share Program (FPS)**

To assess the efficacy of initiating a limited entry program for the Northern shrimp fisheries, addressing latent effort, and developing a historically based allocation program, the PDT queried Northern shrimp landings data for all state license and federal permit holders for the period of 2000 to 2011. Landings data were summarized by state license number and federal permit number for each year. This potentially would allow tracking landings history and a better understanding a vessel's performance over time. However, several data quality assurance/quality control and analytical issues occurred, preventing the completion of the analysis. These issues include:

- 1.) Incomplete reporting in 2000 and 2001. All analyses will have to be from 2002 forward.
- 2.) Inconsistent means of indentifying an individual's landing history from 2002 to 2011. Some permit holders have multiple permits, including a mixture of active permits and inactive permits, state licenses only, federal permit only, and some with both state licenses and federal permits, in some years and not others. Additionally, some federal permits were fished on multiple vessels, and the permit holder may not be the same individual who reported on the VTR. There is also the potential for the history of an "owner" to change between an individual and corporation over time.

The PDT is working with NOAA Fisheries Service to develop a means to track Northern shrimp landings history over time. However, the Section needs to decide whether landings history will be assigned to the vessel permit or the individual, before limited entry can be analyzed further by the PDT.

Option A. Assign landings history to a vessel permit.

By default, unless otherwise specified, the current holder of the permit receives all of the Northern shrimp landings history associated with that permit's fishing history. This could be tracked using the NOAA Fisheries permit history databases; it can also be tracked by a state's license holder with the caveat that some vessels may be listed on more than one license.

Option B. Assign landings history to an individual.

As noted, vessel permit landing history is available for those permitted through NOAA Fisheries, and the PDT would have to further disseminate what vessel(s) an individual operated over specific fishing years. Defining an "individual" that should receive the landings history could be different depending on the type of license/permit being considered. The following scenarios explore the different license/permit type scenarios.

*If the Section selects Option B, Scenarios B1, B2 and B3 must also be considered.*

Scenario B1. *State of Maine licensees who report to the State of Maine* – the vessel ID is attached to a state license and license is attached to a person, so tracking individual landings history is relatively straight forward for this scenario, with some exceptions.

Scenario B2. *State of Maine licensees who report federally* – for the Maine harvesters who report federally on the VTR there is a vessel ID; however, there are the following sub-options:

Sub-option 1. Assign history to the state license holder. Use Federal VTR records to track and attribute fishing history to a state license holder based on that licensee's reported fishing activity.

Sub-option 2. Assign history to the individual/corporation who held the federal permit at the time of landing. This information is obtained from NOAA Fisheries permit system.

Sub-option 3. Assign history to the individual who is named on the VTR. This information is obtained from the VTRs.

Scenario B3. *New Hampshire and Massachusetts participants who report federally* – All landings would be reported through VTR. The VTR has a vessel ID and a permit number and an individual's name. The individual's name may not match the permit holder's name. There are the following sub-options:

Sub-option 1. Assign history to the individual/corporation who held the federal permit at the time of landing. This information is obtained from the NOAA Fisheries permit system.

Sub-option 2. Assign history to the individual who is named on the VTR. This information is obtained from the VTRs.

In all cases, the PDT recommends that there be a process by which participants could review their data and appeal any allocations or entry limitations derived from those data.

### 3.8.2 License Cap Program (LCP)

The Northern Shrimp PDT analyzed the empirical data to determine the number of active vessels in the fishery during years when biomass was estimated to be,

**Scenario A: below the Biomass threshold, but above the Biomass limit (Appendix Tables**

- Table 2)

**Scenario B: below the Biomass threshold and below the Biomass limit (**

- Table 3)
- Scenario C: over the stable period in the fishery 1985-1994 (Table 4)

In all of the three scenarios, the range in the number of active vessels overlaps significantly (see Tables 2-4). The mean number of active vessels in Scenarios A and B are similar, whereas, the stable period supports the highest number of active vessels.

The Section may consider a limited entry program that caps the number of licenses based on the mean number of active vessels in the three scenarios. License allocation to each state would then be determined based on the percent of active vessels in each state averaged over the timeframe sub-options below. Note that these timeframes are equivalent to the timeframes used in the TAC allocation, including one additional timeframe from 2000-08.

It is important to note the Plan Development Team cautions that there are too many variables (e.g., varying effort, technological advances) that may limit the usefulness of a limited entry program based on capping the number of licenses. In other words, while this option limits the number of participants in the fishery, there are other factors (e.g., varying effort, technological advances) that may lead to overages in the fishery.

Additionally, if moving forward with capping the number of licenses by state, assigning licenses to specific individuals would be the responsible of each respective state and not the ASMFC. Therefore, each state would have to go through an allocation process that thoroughly reviewed its participants and their respective landings history, before the state assigned licenses to individuals. The appeals process for the licenses would also be the responsibility of each respective state.

#### Option A. Cap the number of licenses at 256 (Scenario A)

Sub-options A	Timeframes	ME	NH	MA	Total
A1	2001-2009	224	22	9	256
A2	2001-2011	226	21	9	256
A3	2003-2008	226	22	8	256
A4	1998-2006	213	26	17	256
A5	2000-2008	223	23	10	256

Option B. Cap the number of licenses at 247 (Scenario B)

Sub-options B	Timeframes	ME	NH	MA	Total
B1	2001-2009	216	22	9	247
B2	2001-2011	218	20	9	247
B3	2003-2008	218	21	8	247
B4	1998-2006	206	25	16	247
B5	2000-2008	215	22	10	247

Option C. Cap the number of licenses at 299 (Scenario C)

Sub-options C	Timeframes	ME	NH	MA	Total
C1	2001-2009	262	26	11	299
C2	2001-2011	264	24	10	299
C3	2003-2008	264	25	10	299
C4	1998-2006	249	30	20	299
C5	2000-2008	260	26	12	299

For informational purposes, the table below has the percent of active vessels by state for the timeframes used to compute the tables above, along with the average number of active vessels over those timeframes. The table below also contains the average number of licenses issued (not necessarily active) by the state of Maine for the timeframes. It does not include New Hampshire or Massachusetts because they do not issue a specific northern shrimp license.

Option	Timeframes	ME	NH	MA	Average # Active Vessels	Average # Issued ME Licenses
1	2001-2009	87.6%	8.8%	3.6%	204	439
2	2001-2011	88.4%	8.2%	3.5%	218	463
3	2003-2008	88.3%	8.4%	3.3%	198	418
4	1998-2006	83.3%	10.1%	6.6%	225	475
5	2000-2008	87.1%	8.9%	4.1%	217	461

**Appendix Tables**

**Table 2. Summary statistics of active vessels when Biomass was estimated to be below the Bthreshold, but above the Blimit.**

Year	% below BThreshold	Active Vessels
1993	6%	273
1994	23%	247
1997	0%	311
2004	31%	192
Range	Mean	Median
192-311	256	260

**Table 3. Summary statistics of active vessels when Biomass was estimated to be below the Bthreshold, and the Blimit.**

Year	% below Blimit	Active Vessels
1998	19%	260
1999	34%	238
2000	34%	287
2001	42%	275
2002	39%	198
2003	23%	222
Range	Mean	Median
198-287	247	249

**Table 4. Summary statistics of active vessels over the stable period in the fishery 1985-1994 (Note from 1985-1992 the number of active vessels by year is approximate).**

Year	% above (+) or below (-) BThreshold	Active Vessels
1985	11%	300
1986	42%	300
1987	45%	345
1988	20%	390
1989	6%	310
1990	35%	250
1991	39%	250
1992	17%	325
1993	-6%	273
1994	-23%	247
Range	Mean	Median
247-390	299	300