

Technical Analysis of the of V-notch compliance rates in Lobster Management Area 1

ASMFC Lobster Technical Committee

June 2003

Work Task Description

During the November 2002 Board Meeting, the Board revisited the technical committee's report on the model for evaluation and performance criteria for v-notching. The Board passed the following motion on this subject:

Move to substitute the main motion to approve the TC recommendation on the use of the model for evaluation and performance criteria for v-notching. The TC will provide the results of this model use at the February Board Meeting and will continue to work to develop other models.

Process for Technical Analysis and Development of Recommendations

The technical committee discussed the work task from the board and decided that it was first necessary to agree upon the appropriate input data for the analysis. The v-notching model requires three specific data inputs, the fishing mortality rate, the observed percentage of newly notched female lobsters in the population, and the percentage of old notched female lobster already existing in the population.

Summary of Technical Committee Discussions

The technical committee agreed that to maintain consistency with EPR baseline model runs for Area 1, and with the last stock assessment, that it was necessary to update fishing mortality runs using the same techniques used in the last stock assessment (Delury generated, blended MA & NMFS, abundance weighted F's).

The TC discussed what would be the most appropriate data to represent the percentage of female lobsters with v-notches that were made in the most recent fishing season. The TC agreed that the observed percentage of egg-bearing females with green eggs (newly extruded) and "new" v-notches in the months of October and November would be the most representative. Female lobsters typically extrude their eggs in July, and therefore become available to notching by the fishery thereafter. Using the combined months of October and November allows for the egg bearing females to be exposed to the fishery for a few months after extrusion, and thus allows for the percentage of female lobsters v-notched in the population within that fishing season to accumulate. To make the model coincide with when the egg extrusion period begins and commercial sea-sampling ends the model time step was set to 150 days and was assumed to start on July 1st of any given year.

The TC discussed what would be the most appropriate data to represent the percentage of female lobsters with v-notches already in the population that presumably were made in the previous fishing season. The TC agreed that the observed percentage of egg-bearing females with old notches and green eggs in the months of July and August would be the most representative. Female lobsters with "old" v-notches and green eggs

(newly extruded) could only have been notched in a previous fishing season since female lobsters molt before extruding eggs.

The TC also discussed the most appropriate means to combine the observed percentages of both new v-notched lobsters and old v-notched lobsters, from the three states within Area 1 (Maine, New Hampshire, & Massachusetts), in order to obtain an Area 1 wide estimate of v-notch compliance. The TC agreed that a landings weighted average observed proportion of v-notched lobsters in the population would provide the most accurate Gulf of Maine wide estimate. This approach ensures that a state's contribution to the average is proportional to it's Area 1 lobster landings.

Technical Committee Finding(s)/Recommendation(s)

Area 1 Observed Proportion of V-notched Female Lobsters

The observed proportion of newly v-notched lobsters in the catch as observed through sea-sampling has increased over the last 5 years in Area 1 as a whole (Table 1). This increase is indicative of an increase in the v-notching rate in the Gulf of Maine. Similarly, the observed proportion of newly v-notched lobsters in the catch in the Massachusetts portion and the New Hampshire portion of Area 1 has increased over the last 5 years (Table 2). The observed proportion of newly v-notched lobsters in Maine coastal waters has increased moderately over the last four years (Table 2).

Fishing Mortality Rates in Area 1

Fishing mortality estimates were updated to survey year 2000, which includes survey and catch data through September of 2001. It was not possible to calculate fishing mortality beyond this time period because 2002 landings data are not yet available. The 3 year blended Gulf of Maine abundance weighted fishing mortality rates have increased over the last 4 years. The 1998 to 2000 average F for female lobsters is 0.98, as compared to the 1995 to 1997 average of 0.74 reported in the last stock assessment (Table 2). Fishing mortality rates in the Massachusetts portion of the Gulf of Maine have increased slightly from 1.97 in survey year 1997 to 2.04 in survey year 2000 (Table 3). State specific fishing mortality estimates are not available for Maine or New Hampshire because neither state has a long enough trawl survey time series to calculate fishing mortality rates at this time.

V-notch Compliance in Area 1

V-notch Model run results indicate the Area 1 wide v-notch compliance rate was 100% in 2002 (Table 2). However, it should be noted that 100% compliance was reached well below observed % notched at the current estimated F. This indicates that either the percent of "new" notches observed in commercial sea-sampling is greatly over-estimated, or the Gulf of Maine estimate of fishing mortality is greatly under-estimated. Given that there are very few tows in the NMFS Autumn Trawl survey within the inshore portion of the Gulf of Maine, where the majority of the LCMA 1 trap fishery occurs, it is likely that the fishing mortality estimates are biased low. This bias would account for the compliance rate reaching 100% before the observed % new notches was reached in the model at the current F. Despite this bias, it appears that the overall v-notch compliance rate in the GOM is high.

The Massachusetts inshore trawl survey time series allows for the calculation of fishing mortality rates specific to the MA portion of the Gulf of Maine. For this reason, it is possible to examine the v-notch compliance rate in the Massachusetts portion of Area 1. Mandatory v-notching was adopted in Massachusetts in 2002. This is evidenced by a large increase in v-notch compliance, from < 1% in 2000 to 32.5% in 2002 (Table 3). It should be noted that the 2002 MA estimate of v-notch compliance assumes that fishing mortality rates have remained static since the fall of 2001. Survey year 2000 fishing mortality rates were used because it is not possible to calculate the survey year 2001 fishing mortality rate without landings data for 2002.

Table 1. Observed proportion of newly v-notched egg-bearing female lobsters.

Year	ME	NH*	MA
1998	54.91		0.50
1999	50.79	36.00	1.16
2000	61.26	29.00	4.95
2001	61.00	47.00	12.41
2002	67.27		22.47

*NH does not differentiate between "new" notches and "old" notches in their sea-sampling protocol.

Table 2. Weighted average % observed new V-notch and old V-notch, fishing mortality, and V-notch compliance in Area 1.

Year	Survey Year	GOM Weighted % Obs. New V-Notch	GOM Weighted % Obs. Old V-Notch	GOM Blended 3 Year Avg F	GOM TOTAL Compliance Rate
1998	1997	46	41	0.85	100%**
1999	1998	42	36	0.87	100%**
2000	1999	52	46	0.93	100%**
2001	2000	54	38	0.98	100%**
2002	2001	61	28	0.98*	100%**

*100% Compliance reached well below observed % notched at estimated F.
 **100% Compliance reached well below observed % notched at estimated F.

Table 3. Percent observed new V-notched and old V-notched, fishing mortality, and V-notch compliance in MA Area 1.

Year	Survey Year	MA % Observed New V-Notch	MA % Observed Old V-Notch	MA Area 514 F	MA Compliance Rate
1998	1997	0.50	2.33	1.97	<1%
1999	1998	1.16	1.6	1.48	<1%
2000	1999	4.95	7.69	1.56	<1%
2001	2000	12.41	15.15	2.04	17.5%
2002	2001	22.47	5.21	2.04*	32.5%

* Assumes that F has remained static since fall 2001.