WHITE PAPER REVIEW OF ATLANTIC STATES MARINE FISHERIES COMMISSION ATLANTIC HERRING SPAWNING REGULATIONS

February 1, 2012

This paper was created by the ASMFC Atlantic Herring Technical Committee (TC) Chair and ASMFC staff to provide a comprehensive review of ASMFC spawning regulations. The Atlantic Herring Section (Section) initiated a TC review at the ASMFC Winter Meeting in November 2011, following concern that the current definition of "spawn" herring may not cover the bulk of spawning fish. The TC first discussed the Section's task during a conference call held on December 14, 2011 and agreed that further analysis was necessary before spawning closure management recommendations could be made. A draft whitepaper was prepared in early January, the TC reviewed the document on January 13, 2012 over a web conference, and members of the TC reviewed the final draft in late January 2012. The recommendations in this document are the consensus of the TC.

The TC recommends that the Section initiate an addendum to: 1) refine sampling protocol; 2) investigate shifting the boundary between the Western Maine and Massachusetts/New Hampshire (MA/NH) spawning areas south; 3) specify the goals and objectives of the spawning closures; and 4) include all spawning regulations in one document for clarity. To be clear, this recommendation does not include any significant changes to the overall spawning area closures. The TC is highly supportive of the current spawning regulations that effectively protect the bulk of herring when aggregated for spawning. A description of the ASMFC's spawning regulations and discussion of the TC's recommendations follow.

ASMFC SPAWNING REGULATIONS

The full suite of ASMFC spawning regulations is a compilation of sections from Addendum I to Amendment 1 (Addendum I), Amendment 2, and Technical Addendum I to Amendment 2. Each requirement has been separated for clarity. Full text can be found in Appendix A.

Goals and Objectives of the Spawning Closures (Addendum I and Amendment 2):

Addendum I includes the following text:

> *Fishermen, scientists and managers have expressed concern over the susceptibility of Atlantic herring to fishing when they aggregate for spawning. Fishing on spawning aggregations not only results in high catch rates, but may interfere with the spawning behavior of the herring not caught. This is also the time when herring are their most valuable, as the fat content of the fish is generally at its peak. The economic reasons to allow fishing on spawning herring, however, are offset by the conservation concerns. Another factor to consider is that herring in the latter stages of spawning are not fit for some markets and if harvested, may be discarded, thereby increasing the overall mortality while contributing nothing to the fishery.*
>
> *Atlantic herring schools are especially susceptible to fishing when they aggregate for spawning. This is also when herring are most valuable, as fat content is generally at its peak. The economic reasons to allow fishing on spawning herring, however, are countered by conservation concerns. Fishing on spawning herring not only can result in high catch rates, but may also interfere with the spawning behavior of those herring not caught. Herring in the latter stages of spawning may not be fit for some markets. Therefore, Addendum I defines specific measures which are designed to reduce the*

exploitation and disruption of herring spawning aggregations, while providing a limited opportunity to harvest herring during that time of the year.

Amendment 2 expands on these goals:

Landing restrictions on spawn herring are designed to conserve the stock by ensuring recruitment to the stock. Much of the management program is designed to move effort into the offshore areas where the TAC has not been fully harvested and the spawning component is thought to be strong. The inshore component is the most vulnerable component of the stock complex; therefore, management measures are focused on providing the greatest protection to the component that is thought to be most susceptible to overfishing. Protection to the offshore spawning component would come at the expense of putting more pressure on the inshore component of the stock complex.

Atlantic herring schools are especially susceptible to fishing when they aggregate for spawning. While vulnerable, they are also most valuable during spawning because their fat content is at its peak. The economic incentives to harvest spawn herring are countered by conservation concerns for the status of the stock. Fishing on spawning herring not only results in high catch rates, but may also interfere with the spawning behavior of uncaught herring. There is a peak point at which spawn herring is acceptable to the market; spawn herring in the latter stages may not be fit for some markets. Therefore, the amendment defines specific measures designed to reduce the exploitation and disruption of spawning aggregations, while providing a limited opportunity to harvest herring during that time of the year.

Spawning Area Delineation (Amendment 2):

Eastern Maine Spawning Area

All waters bounded by the following coordinates:

Maine coast 68^{o} 20' W
43^{o} 48' N 68^{o} 20' W
44^{o} 25' N 67^{o} 03' W
North along US/Canada border

Western Maine Spawning Area

All waters bounded by the following coordinates:

43^{o} 30' N Maine coast
43^{o} 30' N 68^{o} 54.5' W
43^{o} 48' N 68^{o} 20' W
North to Maine coast at 68^{o} 20' W

Massachusetts/New Hampshire Spawning Area

All waters bounded by the Massachusetts, New Hampshire and Maine coasts, and
43^{o} 30' N and 70^{o} 00' W

Starting Date: Based on sampling (Addendum I) or by default date (Amendment 2) as follows.

Eastern Maine: August 15
Western Maine: September 1
Massachusetts/New Hampshire: September 21

Sampling Protocol (Addendum I):
Closures in a given area will begin based on the spawning condition of Atlantic herring as determined from commercial catch samples. Commercial catch sampling shall begin by at least August 1 for the Eastern and Western Maine areas, and by at least September 1 for the Massachusetts/New Hampshire area. If sufficient samples are not available, closures will begin on a specified date (see 4.2.1.3 Default Closure Dates) and extend for at least four (4) weeks. Closures in a given area will begin seven days after the determination that female herring in ICNAF gonadal stages III - V from that specific area have reached the following spawning conditions: female herring greater than 28 cm in length have reached a mean gonadosomatic index (GSI) of 20%; or female herring greater than 24 cm and less than 28 cm in length have reached a mean GSI of 15%. Length refers to the mean natural total length, measured from the tip of the snout to the end of the caudal fin in normal position. "GSI" shall mean gonadosomatic index calculated by the following formula: Length refers to the mean natural total length, measured from the tip of the snout to the end of the caudal fin in normal position. "GSI" shall mean gonadosomatic index calculated by the following formula:

[Gonad Weight / (Total Body Weight - Gonad Weight)] x 100 percent

If sufficient sample information is not available for reliably estimating mean GSI in either of the size categories, the restrictions will go into effect automatically on the default closure dates (see 4.2.1.3).

Required Number of Samples (Addendum I):
"Sufficient sample information" shall mean at least two (2) samples of 50 fish or more, in either length category, taken from commercial catches during a period not to exceed seven days apart.

Spawning Closure Length (Amendment 2):
By default, closures will last four (4) weeks. Catch sampling of the fishery will resume at the end of the initial four-week closure period. If catch sampling indicates significant numbers of spawn herring still are being harvested, closures will resume for an additional two weeks. Significant numbers of spawn herring is defined as 25% or more mature herring, by number in a catch sample, have yet to spawn. Mature or "spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.

Tolerance (Amendment2, clarified in Technical Addendum I):
Any vessel is prohibited to fish for, take, land, or possess herring from or within a restricted spawning area. Any herring vessel having onboard spawn herring, which were caught outside of a management area that is under a herring spawning closure, may transit the closed area only if all of its fishing gear has been stowed. An incidental bycatch allowance of up to 2,000 pounds of herring per trip for non-directed fisheries shall be in place during the spawning closures.

TC DISCUSSION AND MANAGEMENT RECOMMENDATIONS

During their December 2012 call, the TC generated a list of questions/issues to be addressed in this whitepaper. Some preliminary analyses were run and the TC discussed each question/issue on the follow-up conference call as follows:

1. Do less than 24 cm fish spawn earlier than larger spawners?

The current regulations specify that closures begin based on the % of stage III – V spawn herring that are less than 24 cm. The TC considers this language to be in error and some states have interpreted it as less than *or equal to* 24 cm in their current regulations. The TC recommends changing the size bin to <=24 cm or possibly smaller based on preliminary results.

An examination of the data suggests that spawners within an area spawn at roughly the same time regardless of size. Consistent with previous analyses, males continue to mature faster than females, but pause in their development to full spawning, until the local females have reached maturity. As such, no change in timing of the spawning period should be evident with a change in fish size.

Over recent years commercial biological sampling has revealed that fish are maturing at the same age, but at a smaller size. As outlined in the most recent 2009 TRAC assessment, both length and weight at age has been in steady decline since the 1980's (See also Figure 1). As a result, mean fish length of age 3's (typically first time spawners) is now below 24 cm total length during the fall spawning period. Using the protocols outlined in Addendum I, states have been required to only consider fish greater the 24 cm when determining spawning closures. As can be seen in figure 2 and table 1, a growing number of fish in the 23-24 length bin are mature.

Given this information, managers may wish to examine the 24 cm cut of in determining spawning closures. Possible alternatives include;

- 22 cm or greater
- 23 cm or greater
- Status quo

2. Do the default spawning dates overlap with peak spawning times?

Because directed fishing is prohibited during a spawning closure, it is difficult to determine the exact date of spawning. However past performance indicates that despite some annual variability, there is no statistically significant shift in the start or end dates compared to the defaults (St.Dev. 3.5 – 21). However, for some areas such as E. and W. Maine, start dates have averaged around 5 - 6 days later than the default dates (Table 3 – 6).

The lack of statistically significant results precludes the TC from recommending any changes to the default dates. However, members of the TC would not be opposed to shifting the default start date of an area based on the average delay. One reality of delaying the E. and W. Maine

start dates would be an increased overlap between spawning closure dates which could close all of the inshore Gulf of Maine for a short period of time.

3. Are regulations necessary (or practical) to address vast differences between sampled herring taken in the northern and southern range of spawning areas on the same dates?

The TC raised this question because herring samples collected by Maine Department of Marine Resources (ME DMR) and Massachusetts Department of Marine Fisheries (MA DMF) to determine the start date for the MA/NH spawning area closure, often give different results. Herring in the northern range of the MA/NH area tend to be in later stages of spawning compared to herring collected in the southern range.

This discrepancy could be addressed by creating a new spawning area to be monitored, or adjusting the MA/NH- Western Gulf of Maine spawning area boundaries. Of these two, shifting the area boundaries seems to be more warranted given the sampling data available from MA DMF and ME DMR. Accordingly, shifting the border between the Western Maine and MA/NH boundary south may be necessary to more accurately cover distinct spawning groups of herring. If the Section initiates an addendum, the TC will further analyze spawning samples by area to refine the boundaries. Members of the TC commented that while the boundaries and sampling protocol could be improved, the regulations have worked well in the past because of open communication between MA DMF and ME DMR staff.

4. Do the current spawning closure regulations effectively protect local populations from extinction/extirpation? Could the regulations be improved upon?

The TC agrees that these measures are highly effective to protect the bulk of spawning fish when aggregated for spawning. Schools of herring are easy to locate and catch when aggregated and these broad closures protect productive spawning females and shift fishing effort to other areas.

5. Should the goals of the spawning closures be clarified or expanded?

Language discussing goals and objectives of the spawning closures is on page 1 of this report. Common themes include: protecting schools of spawning fish when they are aggregated for spawning and are particularly susceptible to fishing; to not interfere with spawning behavior of the herring not caught; maximize the value of the fishery by leaving spawn herring which are not fit for some markets; shift fishing pressure to offshore areas; conserve the stock by improving recruitment; protect the component of the stock that is most vulnerable to overfishing.

TC members agree that determining the goals and objectives of the spawning closures is a policy decision. While members did not comment about what the goals should be, they agree that clarification may be necessary, and should be included in an addendum.

6. Is it appropriate to sample a non-directed trip? Is "directed-only" definable or practical?

The TC agrees that it is impractical and unnecessary to require that samples come from directed fishing trips only. When an area is closed for spawning, directed fishing is prohibited and the non-directed trips are the only source of herring samples. If samples include significant numbers of spawn herring, that is evidence that spawn herring are present in the area and the closure should be extended.

7. How many samples are necessary?

Current regulations require "at least two samples of 50 fish or more, in either length category, taken from commercial catches during a period not to exceed seven days apart". The TC agrees that the requirement should be increased to 100 fish per sample. TC members commented that sampling protocol was based on a reasonable amount of samples for states to collect and interpreting the samples is often a qualitative science. Collecting two 100 fish samples in a week is sufficient to determine if a closure should be extended.

8. Do the spawning regulations provide sufficient guidance for standardized regulations between states?

The TC agrees that the spawning regulations *do not* provide sufficient guidance for standardized regulations between states, as evidenced by the lack of consistency of states current spawning regulations. Maine does not define "sufficient samples" necessary to determine the end of a spawning closure, and specifies that both 20% and 25% spawn herring in an area will trigger a two-week closure extension. New Hampshire's size bins include => 24 cm and <= 28 cm, however ASMFC regulations specify >24 cm and <28 cm. Massachusetts' regulations are fully compliant.

The TC does not highlight these inconsistencies with the intent that the Section find Maine and New Hampshire out of compliance, but rather to demonstrate the need for an addendum to clarify the spawning regulations. During the discussion, TC members reiterated that the regulations have still worked well (open and close dates consistent between states, dates set to protect bulk of spawning herring) because of good communication and cooperation between state fisheries agency staff. However, members of the TC agree that future communication and cooperation is not guaranteed to continue as personnel transitions occur.

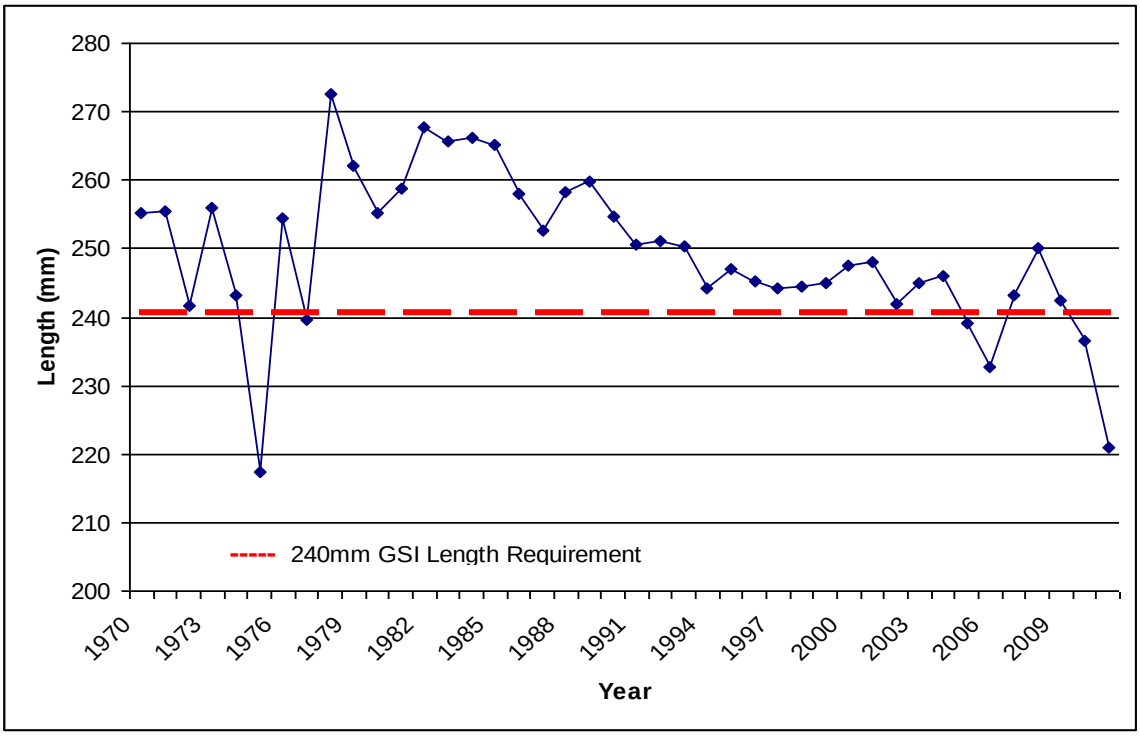


Figure 1. Mean total length (in mm) of age three females caught in area 1A during the spawning season (Aug –Oct).

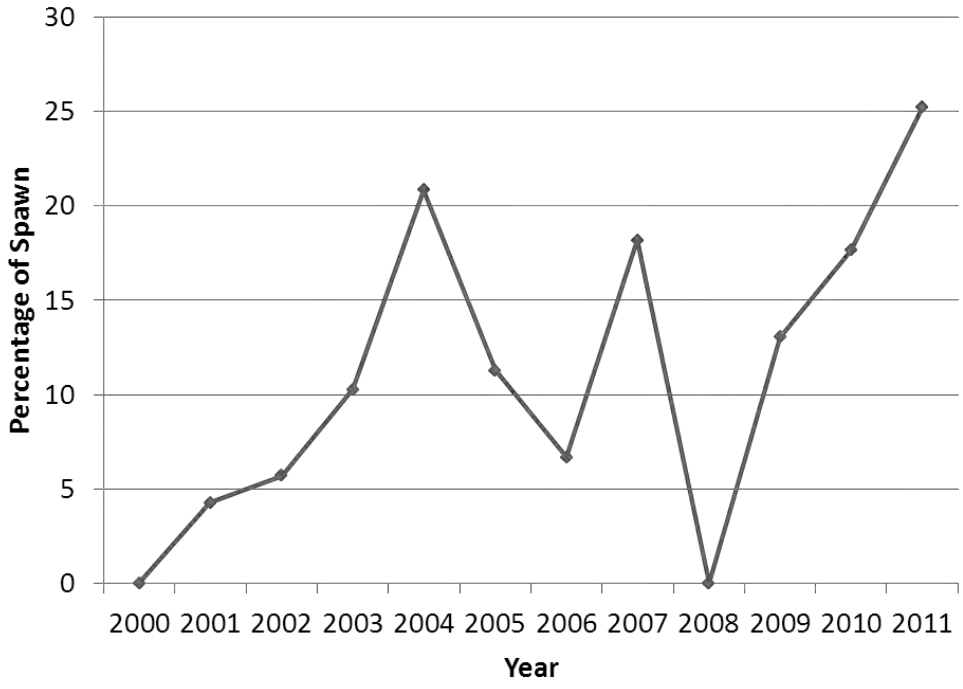


Figure 2. Percentage of spawning or developing females (> 10% GSI or > ICNAF stage 3) Aug – Oct. by year in Area 1A, for fish 24-25 cm total length. Note: from commercial samples.

Table 1. Percentage of spawning or developing females (> 10% GSI or > ICNAF stage 3) Aug – Oct. by year and length bin from commercial samples. Note blank cell are because of "no data" while zeros are calculated

Total Length (cm)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	average 2000-2011
21-22										0		20	10
22-23			5	0		0	0	0		0	0	23	4
23-24	0	4	6	10	21	11	7	18	0	13	18	25	11
24-25	31	16	38	13	27	23	9	19	0	19	12	30	20
25-26	39	28	49	30	38	42	15	20	11	18	30	40	30
26-27	70	36	65	42	59	57	29	26	24	7	27	55	41
27-28	87	76	85	66	67	72	41	35	47	29	37	80	60
28-29	94	84	90	77	74	74	62	50	51	46	44	69	68
29-30	96	96	96	89	84	81	71	68	59	64	64	68	78
30-31	98	100	100	92	86	94	72	84	73	83	69	100	88
31-32	100	100	100	100	100	95	73	90	85	100	100	100	95
32-33	100	100	100				83	100	50	0	67		55
33-34							100	100	100				

Table 3. Spawning closure start dates 2005 - 2011

	Eastern Maine		Western Maine		MA/NH	
	Close	Open	Close	Open	Close	Open
Default	**15-Aug**	**12-Sep**	**1-Sep**	**29-Sep**	**21-Sep**	**19-Oct**
2011	25-Aug	21-Sep	4-Sep	1-Oct	16-Sep	13-Oct
2010	15-Aug	11-Sep	1-Sep	28-Sep	1-Oct	28-Oct
2009	25-Aug	22-Sep	17-Sep	14-Oct	21-Sep	18-Oct
2008	17-Aug	14-Sep	5-Sep	3-Oct	21-Sep	19-Oct
2007	11-Aug	8-Sep	13-Sep	11-Oct	24-Sep	19-Oct
2006	28-Aug	25-Sep	1-Sep	1-Nov	15-Sep	13-Oct
2005	22-Aug	18-Sep	2-Sep	20-Sep	21-Sep	19-Oct

Table 4. Spawning closure length in days from 2005 - 2011

	E. Maine	W. Maine	MA/NH
2011	27	27	27
2010	27	27	27
2009	28	27	27
2008	28	28	28
2007	28	28	25
2006	28	61	28
2005	27	18	28

Table 5. Difference (in # of days) between actual closure dates when compared to defaults. Negative value indicates that a spawning closure began earlier than the default date.

	Eastern Maine		Western Maine		MA/NH	
	EM Close	EM Open	WM Close	WM Open	MA/NH Close	MA/NH Open
2011	10	9	3	2	-5	-6
2010	0	-1	0	-1	10	9
2009	10	10	16	15	0	-1
2008	2	2	4	4	0	0
2007	-4	-4	12	12	3	0
2006	13	13	0	33	-6	-6
2005	7	6	1	-9	0	0
Average 2005 - 2011 (Full Timeseries)	5	5	5	8	0	-1
Average 2010 - 2011 (Quota Reduced 40%)	5	4	2	1	3	2
Average 2008 - 2011 (Zero Tolerance)	6	5	6	5	1	1
Average 2005 - 2007 (20% Tolerance)	5	5	4	12	-1	-2

Table 6. Standard deviation for Table 5 results.

	Easterm Maine		Western Maine		MA/NH	
	EM Close	EM Open	WM Close	WM Open	MA/NH Close	MA/NH Open
Average 2005 - 2011 (Full Timeseries)	6.2	6.2	6.3	13.6	5.3	5.0
Average 2010 - 2011 (Quota Reduced 40%)	7.1	7.1	2.1	2.1	10.6	10.6
Average 2008 - 2011 (Zero Tolerance)	5.3	5.4	7.0	7.0	6.3	6.2
Average 2005 - 2007 (20% Tolerance)	8.6	8.5	6.7	21.0	4.6	3.5

APPENDIX A STATE SPAWNING REGULATIONS:

Maine:

DEPARTMENT OF MARINE RESOURCES

Chapter 36 Herring Regulations

36.01 Herring Management Plan

A. Definitions

(1) Herring.
Herring means Atlantic Sea Herring, particularly the *Clupea Harengus harengus.*

(2) ICNAF gonad stages.

ICNAF gonad stages are the official stages adopted by the International Commission for the Northwest Atlantic Fisheries in 1964.

Excerpt from ICNAF, 1964, Table 2 definitions:
Stage V. Gonads fill body cavity. Eggs large, round; some transparent. Ovaries yellowish; testes milkwhite. Eggs and sperm do not flow, but sperm can be extruded by pressure.
Stage VI. Ripe gonads. Eggs transparent; testes white; eggs and sperm flow freely.

(3) Spawn herring.

Spawn herring is a sexually mature herring (male or female) in ICNAF gonad stages V or VI.

(9) "GSI" means the gonadosomatic index calculated by the following formula:
(Gonad Weight/ Total Body Weight – Gonad Weight) X 100 percent.

D. Catch restrictions.

(1) Spawning area restrictions.

It shall be unlawful to fish for, take, possess, transfer or land in any State of Maine port or facility, or to transfer at sea from any Maine registered vessel, any catch of herring harvested from the following described areas within ASMFC Management Area 1 at the following times:

(a) Eastern Maine:

All waters bounded by the following coordinates:
Maine coast 68° 20.0' W,
43° 48.0' N 68° 20.0' W,
44° 25.0' N 67° 03.0' W,
North along the U.S./Canada border.

Western Maine:

All waters bounded by the following coordinates:
43° 30.0' N Maine coast,
43° 30.0' N 68° 54.5' W,
43° 48.0' N 68° 20.0' W,
North to Maine coast at 68° 20.0' W.

Massachusetts/New Hampshire:

All waters bounded by the Massachusetts, New Hampshire and Maine coasts, and
43° 30.0' N 70° 00.0' W.

(b) Determination of starting dates for spawning areas.

Closures in a given area will begin based on a pre-determined spawning condition of Atlantic herring indicated by commercial catch samples. This spawning condition will be defined as: female herring greater than or equal to 28 cm in length having reached a mean gonadosaomatic index (GSI) of 20%; or female herring greater than 24 cm and less than 28 cm in length having reached a mean GSI of 15%. Closures in a given area will begin seven (7) days after the GSI determination is made. If sufficient samples are not available, closures will begin on area specific dates as follows: Eastern Maine- August 15, Western Maine- September 1, Massachusetts/New Hampshire- September 21.

(c) Duration of spawning area restrictions.

The closure will extend for four (4) weeks. If catch sampling after the end of the initial restricted period determines that 25% or more mature herring, by number, have yet to spawn then the spawning restrictions would resume for an additional two weeks. The 20% tolerance shall be determined by examination of at least one hundred herring selected at random from the catch.

New Hampshire:

Fis 603.07 Sea Herring.

(a) No person shall fish for, take, or possess unprocessed herring within the jurisdiction of New Hampshire from September 21 through October 19, except as specified in (d).

(b) The executive director shall revise the beginning date of the closure so that the closure shall be in effect whenever it is determined that the mean gonad somatic index for female herring 24 - 28 cm in length or greater is 15% or greater or the mean gonad somatic index for female herring 28 cm in length or greater is 20% or greater.

(c) If the results of herring samples collected at the end of the closure indicate that 25% or more by number of mature spawn female sea herring still contain spawn the executive director may extend the

closure for an additional 28 days. "Mature spawn female sea herring" means female sea herring greater than 24 cm in length.

(d) During a spawning closure as specified in (a) through (c), all vessels fishing for species other than sea herring shall be limited to an incidental catch of 2000 pounds of herring per calendar day caught in or from the management area subject to a spawning closure.

(e) Any person, firm or organization engaged in the taking or landing of herring shall first obtain a permit to do so from the executive director.

(f) Any person, firm or organization properly permitted may land herring from areas not under spawning closures provided they are equipped with a functional vessel monitoring system.

(g) Nothing in the above provisions shall prohibit a person from possessing herring for use as bait while in the normal conduct of tending lobster and crab pots or any herring used as bait for angling purposes.

(h) No person shall land, transfer or transport herring taken from a management area or sub-area closed to a directed herring fishery to an internal waters processing operation.

(i) No person shall land herring taken from a management area or sub-area when 95% of the total allowable catch (TAC) for that area's or sub-area's seasonal or annual total allowable catch will be exceeded except a person may land and possess up to a maximum of 2,000 pounds of incidentally caught herring. The executive director shall revise the percentage of TAC, that would trigger a prohibition on landing, to 90% if it is determined that a closure at 95% is insufficient to prevent exceeding the seasonal or annual TAC.

(j) The executive director shall prohibit vessels from landing Atlantic herring caught from a management area which includes state waters from one and seven days per week, except as an incidental catch of a maximum of 2,000 pounds, if its projected that the seasonal or annual total allowable catch of the management area will be exceeded without no landing days. The number of no landing days per week shall be determined by the Atlantic States Marine Fisheries Commission's Atlantic herring section commissioners from New Hampshire, Maine and Massachusetts at a public meeting

(k) No person shall take herring from the waters under the jurisdiction of the state when the total allowable catch assigned to management area or sub-area which includes state waters has been attained except that a person may take and possess up to a maximum of 2,000 pounds of incidentally caught herring.

(l) Vessels shall not land herring more than once per calendar day.

Massachusetts:

322 CMR 9.00: MANAGEMENT OF SEA HERRING

Section

- 9.01: Definitions
- 9.02: Management Area Boundaries

- 9.03: Vessel Size Limit
- 9.04: Management Area 1A Fishing Day Restrictions
- 9.05: Fishing Restrictions & Annual Specifications

- 9.01 Definitions.
- For purposes of 322 CMR 9.00 only, the folowing words shall have the following meanings:
  - (1) Fish for means to harvest, catch or take, or attempt to harvest, catch or take any sea herring by any method or means.
  - (2) Gonad somatic index or GSI means for female herring the percentage obtained by the formula: [Gonad weight/(total body weight - gonad weight)] x 100.
  - (3) GSI Trigger means female herring greater than 28 cm total length with a mean GSI of 20% or female herring greater than 24 cm and less than 28 cm with a mean GSI of 15%.
  - (4) GSI Sampling means at least two samples of 50 fish or more in either GSI trigger length category taken from commercial catches during a period not to exceed seven days apart.
  - (5) Southern Gulf of Maine means that portion of Management Area 1 south of 43 [degrees] 32' N parallel of latitude.
  - (6) Land means to transfer the catch of any sea herring from any vessel onto any land or dock, pier, wharf, or other artificial structure.
  - (7) Management Area means one of three Management Areas as specified in the Atlantic States Marine Fisheries Commission Atlantic Herring Fishery Management Plan (FMP) and NOAA Fisheries federal fishery management plan.
  - (8) Management Area Quotas means the annual area-specific quota as specified by the Atlantic States Marine Fisheries Commission under the authority of the interstate and federal management plans.
  - (9) Massachusetts/New Hampshire Spawning Area means all waters encompassed by an imaginary line beginning at the intersection of the 43 [degrees] 30' N parallel of latitude and the Maine coast; thence in a southwesterly direction along the coasts of Maine, New Hampshire, and the Commonwealth to the intersection of the 70 [degrees] 00' W meridian of longitude; thence in a northerly direction along the 70 [degrees] 00' W meridian of longitude to its intersection with the 43 [degrees] 30' N parallel of latitude; thence in a westerly direction along the 43 [degrees] 30' N parallel of latitude to the point of beginning.
  - (10) Sea Herring means that species of Atlantic sea herring known as Clupea harengus.
  - (11) Spawn Herring means mature sea herring in ICNAF gonadal stages V and VI.
  - (12) Vessel means any waterborn craft registered under the laws of the state as that term is defined in M.G.L. c. 130, § 1.
  - (13) Vessel Fishing for Mackerel means any vessel whose catch on board at any given time is at least 75% mackerel (Scomber scombrus) by weight.
- 9.02 Management Area Boundaries
  - (1) Management Area 1: all U.S. waters of the Gulf of Maine (GOM) north of a line extending from the eastern shore of Monomoy Island at 41º 35’ N latitiude, eastward to a point at 41º 35’ N latitude, 69º 00’ W longitude, thence northeasterly to a point along the Hague Line at 42º 53’ 14” N latitude, 67º 44’ 35” W longitude, thence northerly along the Hague Line

to the U.S. Canadian border, to include state and Federal waters adjacent to the States of Maine, New Hampshire, and Massachusetts. Management Area 1 is divided into Area 1A (inshore) and Area 1B (offshore). The line dividing these areas is described by the following coordinates:

N Latitude	*W Longitude*
41º 58’	70º 00’ at Cape Cod shoreline
42º 38’	70º 00’
42º 53’	69º 40’
43º 12’	69º 00’
43º 40’	68º 00’
43º 58’	67º 22’ (the U.S.-Canada Maritime Boundary)

- (2) Management Area 2: All waters west of 69º 00' W longitude and south of 41o 35' N latitude, to include state and Federal waters adjacent to the States of Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina.
- (3) Management Area 3: All U.S. waters east of 69º 00' W longitude and southeast of the line that runs from a point at 69º 00' W longitude and 41º 35' N latitude, northeasterly to the Hague Line at 67º 44' 35" W longitude and 42º 53' 14" N latitude.
- (4) Management Area Map: [CLICK HERE TO VIEW MAP]

- 9.03 Spawning Herring Protection
  - (1) Prohibition. It shall be unlawful to possess or land any spawn sea herring caught from the Massachusetts/New Hampshire Spawning Area seven days after the GSI trigger for herring from that area is reached. (2) Closure Duration. The prohibition of 322 CMR 9.03(1) shall extend for four weeks and may be extended by the Director if DMF sampling indicates that herring landings comprise more than 25% spawn herring.
  - (3) Default Closure. It shall be unlawful to possess or land any spawn sea herring caught from the Massachusetts/New Hampshire Spawning Area during the period September 21 through October 18 provided the GSI trigger has not been reached by September 14. This prohibition may be extended by the Director beyond October 18 if DMF sampling indicates that herring landings comprise more than 25% spawn herring
  - (4) Exceptions. A vessel may land or possess up to 2,000 lbs. of sea herring during the closure period described in 322 CMR 9.03.
- 9.04 Vessel Size Limit
- It shall be unlawful for any vessel greater than 165 feet in overall length and 3,000 horsepower to land sea herring in the Commonwealth.
- 9.05 Fishing Restrictions & Annual Specifications *
  - (1) Commercial Fishery Limits. It is unlawful for a vessel to land or possess sea herring from:
    - (a) Management Area 1A
      - (i) on no-fishing days specified by the Atlantic States Marine Fisheries Commission and established by the Director through declaration;
      - (ii) when 100% of the Management Area 1A quota is taken or projected to be taken.
    - (b) Management Area 1B & 2

- (i) when 100% of the Management Area 1B or 2 quota, respectively, is taken or projected to be taken.
  - (2) Commercial Fishery Limit Specifications & Adjustments.
    - (a) The director may declare and adjust sea herring commercial fishery landing/possession limits, seasons, and no-fishing days to correspond to limits established by the Atlantic States Marine Fisheries Commission.
    - (b) Prior to any declaration or adjustment of the landing/possession limits for sea herring, the Division shall:
    - (i) obtain written approval by a majority of the members of the Massachusetts Marine Fisheries Advisory Commission;
    - (ii) file notice with the Secretary of State;
    - (iii) publish a notice on the Marine Listserv and Division website; and (iv) directly notify sea herring dealers.
  - (3) Exceptions.
    - (a) Any vessel may land or possess up to 2,000 lbs. of sea herring during prohibited times established by 322 CMR 9.05.
- REGULATORY AUTHORITY
  - M.G.L. c. 130, §§ 2, 17A, 80 and 104.
- ** Please Note: Sea Herring Management Area 1A trip limits have been updated via specification. Please see MarineFisheries Advisory*

APPENDIX B ASMFC SPAWNING REGULATION:

Addendum I to Amendment 1 Spawning Regulations:
4.2 COMMERCIAL FISHERIES MANAGEMENT MEASURES

4.2.1 Spawning Area Closures

Atlantic herring schools are especially susceptible to fishing when they aggregate for spawning. This is also when herring are most valuable, as fat content is generally at its peak. The economic reasons to allow fishing on spawning herring, however, are countered by conservation concerns. Fishing on spawning herring not only can result in high catch rates, but may also interfere with the spawning behavior of those herring not caught. Herring in the latter stages of spawning may not be fit for some markets. Therefore, Addendum I defines specific measures which are designed to reduce the exploitation and disruption of herring spawning aggregations, while providing a limited opportunity to harvest herring during that time of the year.

4.2.1.1 Delineation of Spawning Areas (Figure 1a)

The spawning areas for Management Area 1A (Inshore Gulf of Maine) shall be defined as:

Eastern Maine

All waters bounded by the following coordinates:

Maine coast	68° 20' W
43° 48' N	68° 20' W

44^o 04.4' N 67^o 48.7' W
44^o 06.9' N 67^o 52.8' W
44^o 31.2' N 67^o 02.7' W
North along US/Canada border

Western Maine

All waters bounded by the following coordinates:

43^o 30' N Maine coast
43^o 30' N 68^o 54.5' W
43^o 48' N 68^o 20' W
North to Maine coast at 68^o 20' W

Massachusetts/New Hampshire

All waters bounded by the Massachusetts, New Hampshire and Maine coasts, and 43^o 30' N and 70^o 00' W.

4.2.1.2 Determination of Starting Date for Spawning Closures

Closures in a given area will begin based on the spawning condition of Atlantic herring as determined from commercial catch samples. Commercial catch sampling shall begin by at least August 1 for the Eastern and Western Maine areas, and by at least September 1 for the Massachusetts/New Hampshire area. If sufficient samples are not available, closures will begin on a specified date (see 4.2.1.3 Default Closure Dates) and extend for at least four (4) weeks. Closures in a given area will begin seven days after the determination that female herring in ICNAF gonadal stages III - V from that specific area have reached the following spawning conditions: female herring greater than 28 cm in length have reached a mean gonadosomatic index (GSI) of 20%; or female herring greater than 24 cm and less than 28 cm in length have reached a mean GSI of 15%. Length refers to the mean natural total length, measured from the tip of the snout to the end of the caudal fin in normal position. "GSI" shall mean gonadosomatic index calculated by the following formula:

[Gonad Weight / (Total Body Weight - Gonad Weight)] x 100 percent

If sufficient sample information is not available for reliably estimating mean GSI in either of the size categories, the restrictions will go into effect automatically on the default closure dates (see 4.2.1.3). "Sufficient sample information" shall mean at least two (2) samples of 50 fish or more, in either length category, taken from commercial catches during a period not to exceed seven days apart.

4.2.1.3 Default Closure Dates

In the event of insufficient sample information, closures would commence on the following default dates:

Eastern Maine:	August 15
Western Maine:	September 1
Massachusetts/New Hampshire:	September 21

4.2.1.4 Duration of Closures; Determination of Continuance

Closures would initially last for four (4) weeks. Catch sampling of the fishery will resume at the end of the initial closure period. If catch sampling indicates significant numbers of spawn herring are being harvested, closures would resume for an additional two weeks. Closures would resume if catch sampling determines that 25% or more mature herring, by number, have yet to spawn. Mature or "spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.

4.2.1.5a Tolerance Provision (effective for 2000 season only)

Any vessel may fish for, take, land, or possess "spawn" herring, as identified below, from or within a restricted spawning area as long as such herring comprise less than 20% by number of the amount of herring possessed onboard at any time. "Spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.

A bycatch allowance of up to 2,000 pounds of herring per trip for non-directed fisheries shall be in place during the spawning closures. This bycatch allowance will not be subject to the tolerance provision, i.e. vessels may land "spawn" herring over the 20% by number as long as said vessel lands no more than 2,000 pounds. The amount of herring landed by one vessel in a day, as a bycatch allowance, shall not exceed 2,000 pounds (this prohibits a vessel from making multiple trips in one day to land more than the bycatch allowance). A trip shall be based on a calendar day basis.

Any vessel may fish for, take, land, or possess "spawn" herring from a management area outside of those identified in Section 4.2.1.1. Any herring vessel having onboard spawn herring over the tolerance limit and which were caught outside of a management area that is under a herring spawning closure, may transit the closed area only if all of its fishing gear has been stowed.

4.2.1.5b Bycatch Allowance (to be implemented January 1, 2001)

No directed fisheries for Atlantic herring shall be allowed in a management area subject to a spawning closure. A bycatch allowance of up to 2,000 pounds of herring per trip for non-directed fisheries shall be in place during the spawning closures. The amount of herring landed by one vessel in a day, as a bycatch allowance, shall not exceed 2,000 pounds (this prohibits a vessel from making multiple trips in one day to land more than the bycatch allowance). A trip shall be based on a calendar day basis.

Any herring vessel transiting a management area that is under a herring spawning closure must have all of its fishing gear stowed.

AMENDMENT 2 SPAWNING REGULATIONS:

4.3.2 Spawning Restrictions

Landing restrictions on spawn herring are designed to conserve the stock by ensuring recruitment to the stock. Much of the management program is designed to move effort into the offshore areas where the TAC has not been fully harvested and the spawning component is thought to be strong. The inshore component is the most vulnerable component of the stock complex; therefore, management measures are focused on providing the greatest protection to the component that is thought to be most susceptible to overfishing. Protection to the offshore spawning component would come at the expense of putting more pressure on the inshore component of the stock complex.

Atlantic herring schools are especially susceptible to fishing when they aggregate for spawning. While vulnerable, they are also most valuable during spawning because their fat content is at its peak. The economic incentives to harvest spawn herring are countered by conservation concerns for the status of the stock. Fishing on spawning herring not only results in high catch rates, but may also interfere with the spawning behavior of uncaught herring. There is a peak point at which spawn herring is acceptable to the market; spawn herring in the latter stages may not be fit for some markets. Therefore, the amendment defines specific measures designed to reduce the exploitation and disruption of spawning aggregations, while providing a limited opportunity to harvest herring during that time of the year.

4.3.2.1 Inshore Gulf of Maine Spawning Areas (Area 1A)

Figure 14 displays the areas defined in this measure.

Eastern Maine Spawning Area

All waters bounded by the following coordinates:

Maine coast 68° 20' W
43° 48' N 68° 20' W
44° 25' N 67° 03' W
North along US/Canada border

Western Maine Spawning Area

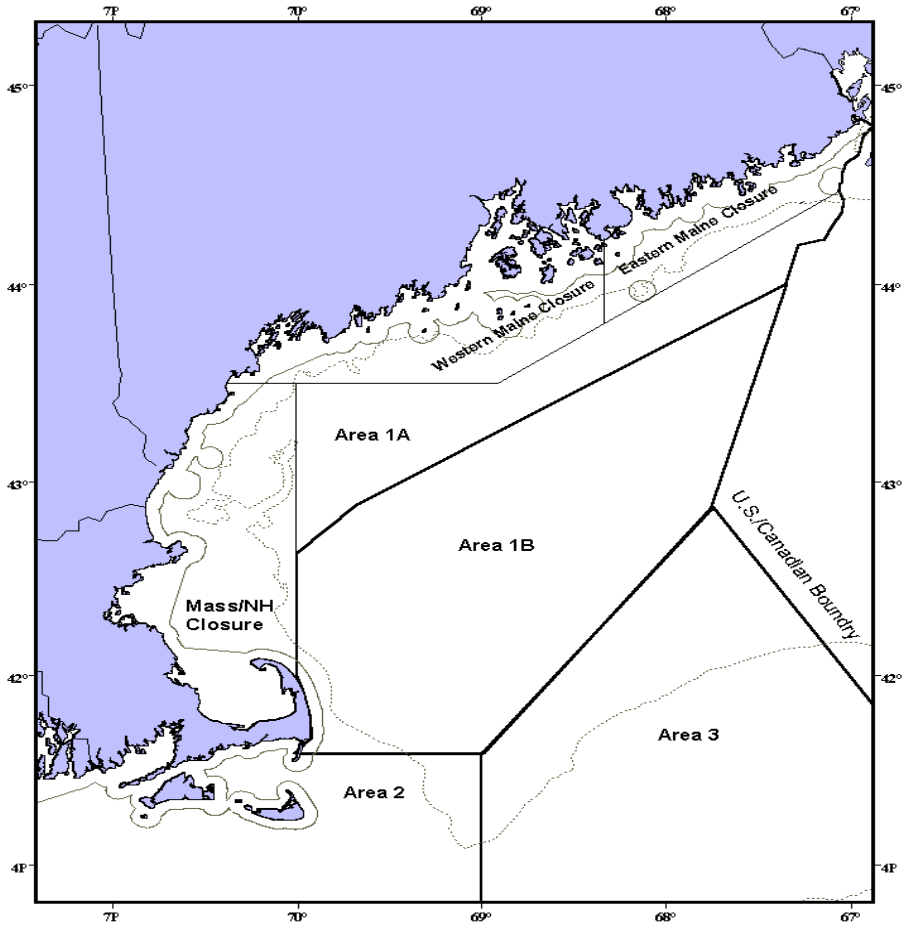
All waters bounded by the following coordinates:

43° 30' N Maine coast
43° 30' N 68° 54.5' W
43° 48' N 68° 20' W
North to Maine coast at 68° 20' W

Massachusetts/New Hampshire Spawning Area

All waters bounded by the Massachusetts, New Hampshire and Maine coasts, and
43° 30' N and 70° 00' W

Figure 1. Spawning Areas for Atlantic Herring in State Waters



4.3.2.2 Spawning Closures & Default Dates

Spawning closures are based on commercial catch samples that are collected by at least August 1 for the Eastern and Western Maine areas, and by at least September 1 for the Massachusetts/New Hampshire area. If sufficient samples are not available, closures will begin on the default dates listed below and extend for at least four (4) weeks. Area 1A inshore spawning area closures will begin on the following dates, unless commercial catch samples show earlier spawning than the default date or continuing two weeks after the four-week closure.

Eastern Maine:	August 15
Western Maine:	September 1
Massachusetts/New Hampshire:	September 21

By default, closures will last four (4) weeks. Catch sampling of the fishery will resume at the end of the initial four-week closure period. If catch sampling indicates significant numbers of spawn herring still are being harvested, closures will resume for an additional two weeks. Significant numbers of spawn herring is defined as 25% or more mature herring, by number in a catch sample, have yet to spawn. Mature or "spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.
Table 10 shows the start and end dates of the area spawning closures for the past four years, as well as the default closure dates from Addendum I (*Section 4.2.1.3* Default Closure Dates). Reviewing the closure information from the past four years, the three spawning areas have closed right around the default closure dates and have lasted for about four weeks. Using the commercial catch samples, Maine had the flexibility to delay the closure date to allow the fishery to continue while providing protection to the stock at the appropriate time. The viability of the spawning closures can be attributed to the collection of commercial catch samples to modify the closure periods providing greater protection to the spawning component of the stock.

Table 11 shows the number of Area 1A commercial catch samples that contained greater than 20% spawning females outside of a spawning closure. Since implementation of Amendment 1 in January 2000, a total of 12 commercial samples collected from Area 1A during August to October have had >20% spawning fish, representing a small fraction of the total samples collected during the time period (~5%). Most of these samples were collected just before the start of the spawning closure between issuing the closure notice and actual start date (Table 12). In many states, it can take 3-5 business days between notice and implementation of a spawning closure because of public notification requirements.

Table 10. Historical and default dates for the spawning area closures (EGOM is Eastern Gulf of Maine; WGOM is Western Gulf of Maine; and MA/NH is Massachusetts/ New Hampshire; see Figure 14)

	AREA					
	EGOM		**WGOM**		**MA/NH**	
YEAR	**Start**	**End**	**Start**	**End**	**Start**	**End**
2000	15-Aug	11-Sept	1-Sept	21-Sept	21-Sept	18-Oct
2001	26-Aug	23-Sept	2-Sept	30-Sept	21-Sept	18-Oct
2002	15-Aug	12-Sept	13-Sept	11-Oct	4-Oct	1-Nov
2003	1-Sept	29-Sept	1-Sept	29-Sept	21-Sept	19-Oct
Default Date	**15-Aug**	**13-Sept**	**1-Sept**	**30-Sept**	**21-Sept**	**19-Oct**

Table 11. Number of samples containing > 20% spawning females (ICNAF stages 5&6). Note total samples are the numbers of samples taken from Area 1A August - October of each year.

Year	# Samples > 20%	Total samples
2000	3	76
2001	0	49
2002	8	70
2003	1	62

Table 12. Year, Spawning Area, and timing of 12 samples containing >20% spawning females

Year	Sample ID	Area	Before or After Closure	Comments
2000	107	EGOM	Before	Within 5 days of start
	109	EGOM	Before	Within 2 days of start
	115	WGOM	Before	Within 3 days of start
2001	N/A	N/A	N/A	N/A
2002	160	MA/NH	Before	Within 10 days of start
	174	MA/NH	Before	Within 5 days of start
	176	MA/NH	Before	Within 2 days of start
	177	MA/NH	Before	Within 5 days of start
	179	MA/NH	After	Within 2 days of end
	180	MA/NH	Before	Within 3 days of start
	193	MA/NH	Before	Within 3 days of start
	207	MA/NH	After	Within 3 days of end
2003	116	EGOM	After	Within 4 days of end

4.3.2.3 Tolerance Provision – Zero Tolerance

Any vessel is prohibited to fish for, take, land, or possess "spawn" herring, as identified below, from or within a restricted spawning area. "Spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.

Any vessel may fish for, take, land, or possess "spawn" herring from a management area outside of those identified in the Delineation of Spawning Areas. Any herring vessel having onboard spawn herring, which were caught outside of a management area that is under a herring spawning closure, may transit the closed area only if all of its fishing gear has been stowed.

An incidental bycatch allowance of up to 2,000 pounds of herring per trip for non-directed fisheries shall be in place during the spawning closures. This bycatch allowance will not be subject to the tolerance provision, i.e. vessels may land "spawn" herring as long as said vessel lands no more than 2,000 pounds. The amount of herring landed by one vessel in a day, as a bycatch allowance, shall not exceed 2,000 pounds (this prohibits a vessel from making multiple trips in one day to land more than the bycatch

allowance). A trip shall be based on a calendar day basis.

4.3.2.4 Other Spawning Area Considerations – Exemption for East of Cutler Fixed Gear Fisheries

Under Amendment 1, all vessels fishing with fixed gear in state waters were required to obtain a permit from the appropriate state agency. While Amendment 1 does not specify an exemption for the fixed gear fisheries in the East Cutler area, these fisheries did have an exemption from the spawning restrictions prior to the amendment. The exemption was granted by the State of Maine and was later removed to comply with Amendment 1 to the Interstate FMP. The East Cutler area is defined in Figure 17 below. With implementation of Amendment 2, East of Cutler fixed gear fisheries are granted an exemption from spawning area considerations and are not limited on the amount of spawn herring that can be landed during a spawning closure.

TECHNICAL ADDENDUM 1A SPAWNING REGULATIONS:
Executive Summary – *4.3.2.3 Tolerance Provision -- Zero Tolerance*

Any vessel is prohibited to fish for, take, land, or possess herring from or within a restricted spawning area except for the incidental bycatch and transiting provisions of Section 4.3.2.3.

Any vessel may fish for, take, land, or possess "spawn" herring from a management area outside of those identified in the Delineation of Spawning Areas. Any herring vessel having onboard spawn herring, which were caught outside of a management area that is under a herring spawning closure, may transit the closed area only if all of its fishing gear has been stowed. "Spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.

4.3.2.3 Tolerance Provision – Zero Tolerance

Any vessel is prohibited to fish for, take, land, or possess herring from or within a restricted spawning area. Vessels are permitted to transit the restricted spawning areas with herring on board provided they comply with the provisions listed in the following two paragraphs.

Any vessel may fish for, take, land, or possess "spawn" herring from a management area outside of those identified in the Delineation of Spawning Areas. Any herring vessel having onboard spawn herring, which were caught outside of a management area that is under a herring spawning closure, may transit the closed area only if all of its fishing gear has been stowed. "Spawn" herring shall be identified as Atlantic herring in ICNAF gonadal stages V and VI.

An incidental bycatch allowance of up to 2,000 pounds of herring per trip for non-directed fisheries shall be in place during the spawning closures. This bycatch allowance will not be subject to the tolerance provision, i.e. vessels may land "spawn" herring as long as said vessel lands no more than 2,000 pounds. The amount of herring landed by one vessel in a day, as a bycatch allowance, shall not exceed 2,000 pounds (this prohibits a vessel from making multiple trips in one day to land more than the bycatch allowance). A trip shall be based on a calendar day basis.

NEFMC HERRING AMENDMENT 5 OVERVIEW

New England
Fishery Management Council

Peter K. Prybot photo

New England Council Readies for Atlantic Herring Public Hearings

• WHY IS THE COUNCIL CHANGING THE HERRING PLAN?

Draft Amendment 5 to the Herring Fishery Management Plan (FMP), which also includes a Draft Environmental Impact Statement (DEIS), has been developed by the New England Fishery Management Council over the course of several years for a number of reasons.

In particular, since the implementation of Herring Amendments 1, 2, and 4, concerns about the fishery have led the Council to determine that additional action is warranted to further address the long-term health of the herring resource, how the resource is harvested, how catch and bycatch in the fishery are accounted for, and the important role of herring as a forage fish in the Northeast.

These concerns have been reflected in the unprecedented level of interest in managing this fishery by New England's commercial and recreational fishermen, eco-tourism and shoreside businesses, and the general public.

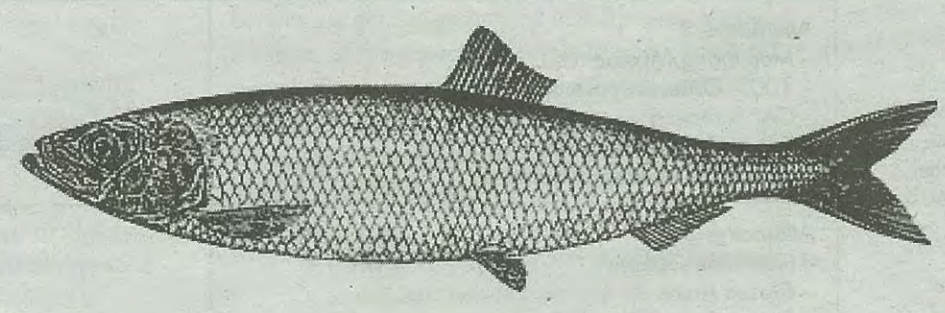
The pages in this supplement are intended to serve as a general guide to fishermen, other stakeholders or any member of the public who is interested in the proposed changes to the program currently in place to manage the Atlantic herring fishery.

The overview here closely tracks the order of Volume I to Amendment 5. Numbers next to various elements in this text refer to sections in Volume I. Once completed, anyone looking for more details should view it online or request a paper copy.

• WHAT IS THE TIMELINE FOR COUNCIL CONSIDERATION OF THE NEW MEASURES AND WHEN WILL THE CHANGES BECOME EFFECTIVE?

The Council plans to take a final vote on the amendment at its April 24-26, 2012 meeting in Mystic, CT. The new rules are expected to be in place by January 1, 2013.

Meanwhile, the amendment and public hearing documents are scheduled to become available in February or March. Public hearings are planned for March. Specific dates and locations for the hearings, including the deadline for comments, will be widely publicized and also posted on the Council website under the Herring Fishery Management Plan at www.nefmc.org.



• WHAT CAN I EXPECT TO FIND IN THE DRAFT AMENDMENT 5 DOCUMENT AND THE DEIS?

The draft amendment document and the DEIS constitute Volume I of this package of rules. It describes in detail the management alternatives under consideration, includes information about all of the components of the ecosystem and fishery that are potentially affected by the measures proposed and evaluates the potential impacts of the management alternatives under consideration.

Volume I also addresses the alternatives under consideration with respect to other laws that are applicable to marine fisheries and provides the public and the Council with adequate information about the measures and their impacts to inform decision-making. Volume II contains appendices with background that interested parties may find extremely useful.

• WHICH MEASURES APPLY TO YOU?

The Council intends that the major elements of the catch monitoring program apply to the limited access herring fishery, or the 100 or so Category A/B and Category C vessels that catch more than 99% of Atlantic herring in a given year. Because the Category A/B boats catch the vast majority of herring (about 97-98%), the Council may evaluate both costs and benefits when determining whether or not Category C

Continued on inside

THIS SUPPLEMENT PROVIDED BY THE NEW ENGLAND FISHERY MANAGEMENT COUNCIL

NEFMC HERRING AMENDMENT 5 OVERVIEW

New England Fishery Management Council

vessels will be subject to all of the requirements of the catch monitoring program.

Similarly, while Category D vessels (open access) are not being considered in the catch monitoring program, there are other measures that could affect them. The Council is considering an option that would require Category D vessels to adhere to the management measures established in this amendment to address river herring bycatch.

This table summarizes the management measures under consideration, to which vessel categories they apply (or may affect), and the options the Council has to select from when it picks the final measures for Amendment 5. The Council is seeking comments on which permit categories the catch monitoring program and the measures to address river herring bycatch should apply.

PROPOSED MEASURES/ALTERNATIVES	CATEGORY A/B (LA DIRECTED)	CATEGORY C (LA INCIDENTAL)	CATEGORY D (OPEN ACCESS)
SECTION 3.1 – ADJUSTMENTS TO FISHERY MANAGEMENT PROGRAM			
Regulatory Definitions	✓	✓	✓
Administrative/General Provisions	✓	✓	✓
Measures to Address Carrier Vessels	*Apply to all carrier vessels regardless of permit category*		
Transfer At-Sea Option 2 (A and B Only)	✓	*Prohibited*	*Prohibited*
Transfer At-Sea Option 3 (Herring-permitted vessels only)	✓	✓	✓
Trip Notification Requirements (pre-trip and pre-landing)	✓	✓	*Only D vessels that use MWT gear and/or qualify for new OA permit for Areas 2/3**
Dealer Reporting Requirements	*N/A*	*N/A*	*N/A*
Changes to OA Provisions for Limited Access Mackerel Vessels in Areas 2/3	*N/A*	*N/A*	✓
SECTION 3.2.1 – ALTERNATIVES TO ALLOCATE OBSERVER COVERAGE ON LA VESSELS			
Alternative 2 – 100% Coverage	✓	*Proposed*	*N/A*
Alternative 3 – SBRM Coverage as Minimum	✓	*Proposed*	*N/A*
Alternative 4 – Coverage based on Council Targets	✓	*Proposed*	*N/A*
Additional Measures to Improve Sampling At-Sea	✓	*Proposed*	*N/A*
SECTION 3.2.3 – MEASURES TO ADDRESS NET SLIPPAGE			
Option 2 – Released Catch Affidavit	✓	*Proposed*	*N/A*
Option 3 – Closed Area I Sampling Provisions	✓	*Proposed*	*N/A*
Option 4 – Catch Deduction and Possible Trip Termination	✓	*Proposed*	*N/A*
MR Experimental Fishery	✓	*Proposed*	*N/A*
SECTION 3.3 – MEASURES TO ADDRESS RIVER HERRING BYCATCH			
Alternative 2 *– Monitoring/Avoidance Options* *– 100% Observer coverage* *– CAI Sampling* *– Trigger-Based Monitoring* *– Two-phase bycatch avoidance*	✓	*Proposed*	*Option to include all D permit holders*
Alternative 3 *– Protection Options* *– Closed Areas* *– Trigger-Based Closed Areas*	✓	*Proposed*	*Option to include all D permit holders*
Section 3.4 – Measures to Address Midwater Trawl Access to Groundfish Closed Areas	*Applies to all vessels fishing with midwater trawl gear, regardless of permit category*		

Some of the Common Acronyms Used in Amendment 5

CAI – Closed Area I; **CV** – Coefficient of variation*; **DEIS** – Draft Environmental Impact Statement; **EFP** – Experimental Fishery Permit; **FMP** – Fishery Management Plan; **LA** – Limited Access; **LOAs** – Letters of Authorization; **MR** – Maximized Retention; **NEFOP** – Northeast Fishery Observer Program; **OA** – Open Access; **PTNS** – Pre-Trip Notification System; **RH** – River Herring; **SAFIS** – Standard Atlantic Fisheries Information System; **SBRM** – Standard Bycatch Reporting Methodology*; **VMS** – Vessel Monitoring System; **VTRs** – Vessel Trip Reports

***CVs or Coefficients of Variation**: CVs provide a convenient way to compare the relative uncertainty of two estimates (lower is better), but they must be interpreted carefully. Assuming a normal distribution, *doubling* the CV produces the approximate 95% confidence interval.

For example, a CV of *0.30* for a bycatch estimate (or 30%) means that if the data could be re-sampled or re-collected, the resulting new estimate would be within ± *60%* of the original estimate 95% of the time (the other 5% of the time the new estimate would be more than 60% different).

***SBRM: Standard Bycatch Reporting Methodology** Generally, an SBRM can be viewed as the combination of sampling design, data collection procedures, and analyses used to estimate bycatch in multiple fisheries.

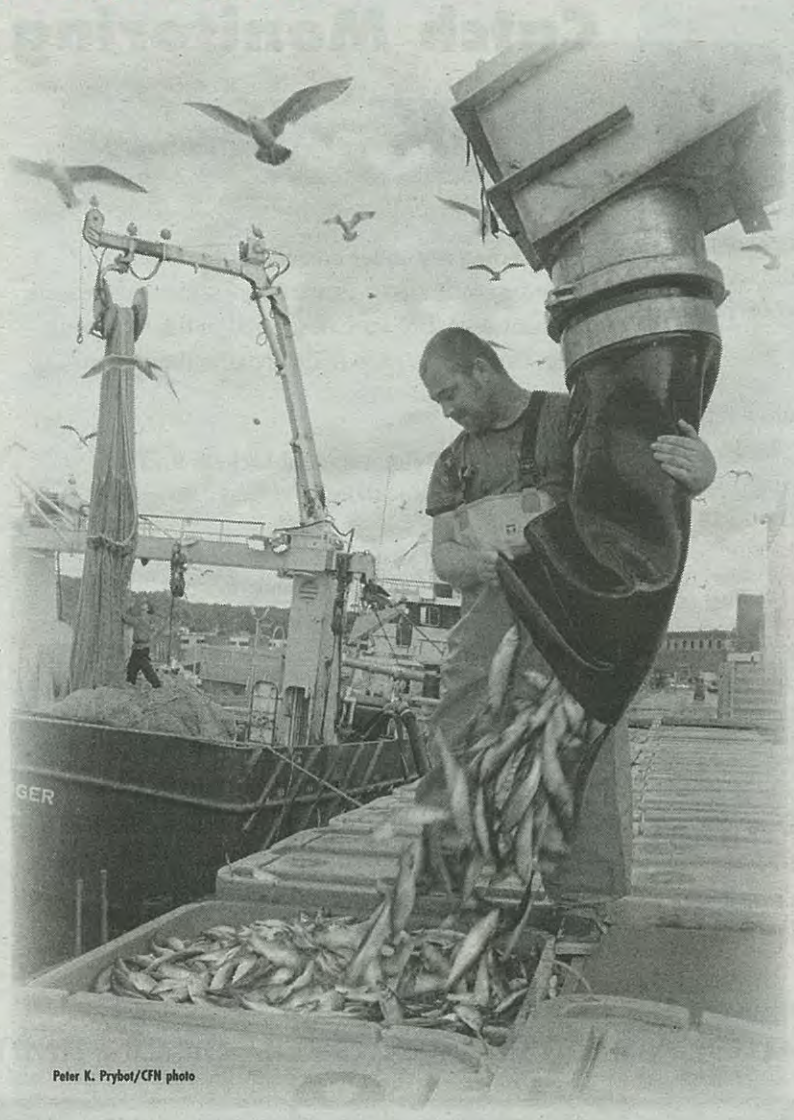
Major Alternatives Proposed in Herring Amendment 5

Fishery Management Program Adjustments

Regulatory Definitions

Amendment 5 would establish a regulatory definition of *transfer at sea* and a regulatory definition of *offload* to clarify provisions related to each vessel engaged in transfer operations and to clarify reporting provisions. A single alternative is under consideration, in addition to taking no action.

> Defining a herring transfer at sea as: *a transfer from an Atlantic herring vessel (i.e. in the vessel hold or on deck), codend, purse seine to another vessel for personal use as bait, to an Atlantic herring carrier or at-sea processor, or to another permitted herring vessel. Two vessels hauling one codend is pair trawling and is not considered a transfer at sea.*
>
> *For the purposes of the Atlantic herring fishery, an offload or "offloading" means to remove, begin to remove, to pass over the rail, or otherwise take fish away from any vessel for sale to either a permitted at-sea Atlantic herring dealer (as defined in the proposed Amendment 5 measures) or a permitted land-based Atlantic herring dealer.*



Peter K. Prybot/CFN photo

Administrative/General Provisions

Some administrative/general provisions are proposed to address fishing operations involving multiple vessels, as well as vessel monitoring system (VMS) and vessel trip report (VTR) requirements.

These include expanding possession restrictions to all vessels working cooperatively in the Atlantic herring fishery (including purse seine vessels and vessels that transfer herring at-sea); and/or eliminating the VMS "power down" provision for limited access herring vessels; and/or establishing a new at-sea herring dealer permit.

Carrier Vessels

Reporting provisions could be modified to clarify that herring carrier vessels are required to report a National Marine Fisheries Service (NMFS) specified trip identifier (for example, the VTR serial number) from the catcher vessel when the carrier offloads to a dealer.

Carrier vessels acting as dealers would be required to report the NMFS-specified trip identifier from the catcher vessels in their dealer reports. This measure is intended to improve the reporting of herring transferred at-sea. Amendment 5 would eliminate the VTR reporting requirement for herring carrier vessels when they are engaged in carrying activities.

Letters of Authorization (LOAs) issued by NMFS for the Atlantic herring fishery currently allow an unlimited amount of herring (or the amount allowed by a vessel's herring permit) to be transferred at-sea: a.) from herring catcher vessels to carriers; b.) between federally-permitted herring vessels; and c.) from herring catcher vessels to non-permitted vessels for personal use as bait. The status quo would remain in place under the no action alternative. Two other available options would require or provide for:

- At-sea herring dealer permits for carriers that sell fish at sea; require VMS use on carrier vessels for declaration purposes and eliminate the seven-day LOA enrollment period
- Dual option for carriers; VMS or current LOA, to accommodate smaller carrier vessels that do not use a VMS.

Transfers at Sea

These measures are intended to minimize transfers at sea and/or standardize reporting requirements for vessels transferring/receiving herring. The two available options are not necessarily independent of each other.

- Allow only vessels participating in the limited access directed fishery for Atlantic herring (Category A or B permits) to transfer herring at sea
- Allow only vessels that possess a federal Atlantic herring permit to transfer herring at sea. Non-permitted vessels would be prohibited from receiving herring at-sea, even for personal use as bait.

Trip Notifications

The Council is proposing to incorporate all limited access vessels and all carrier vessels into the pre-trip notification system (PTNS) for observers. There will be a number of options available to notify the Northeast Fisheries Observer Program (NEFOP).

Reporting for Federally Permitted Dealers

Federally permitted dealers would be required to weigh all fish in all cases. This option could be selected in combination with any one or more of the three sub-options listed below.

- If not sorted by species, require dealers to annually document how the composition of mixed catch is estimated; and/or
- Require dealers to document how the composition of mixed catch is estimated for every landings submission; and/or
- Require dealers to obtain vessel representative confirmation of Standard Atlantic Fisheries Information System (SAFIS) transaction records at the first point of sale.

Continued on next page

NEFMC HERRING AMENDMENT 5 OVERVIEW

New England Fishery Management Council

Open Access Permit Provisions for Limited Access Mackerel Vessels

These measures are intended to apply to mackerel vessels that possess an open access incidental catch permit for herring. The FMP currently allows these boats to retain up to three metric tons (6,600 pounds) of herring in all management areas.

The purpose of the new measures is to allow these boats to land their herring rather than discard what they catch beyond the current limit. Herring bycatch in this fishery has become an increasing concern as the mackerel fishery expands.

The new proposals would increase the open access possession limit to either 10,000 or 20,000 pounds in areas 2 and 3 for vessels that also have a limited access mackerel permit.

PLEASE NOTE – The Council may determine that mackerel limited access permit holders should be treated differently, depending on their level of activity in both the herring and mackerel fisheries and the type of limited access mackerel permit they may possess.

Catch Monitoring at Sea

Observer Allocations

The alternatives under consideration to allocate observer coverage on limited access herring vessels (Categories A/B/C) are described in the following table. In general, each management alternative includes the following:

- ✓ **Priorities and targets and for allocating coverage;**
- ✓ **A process for reviewing, allocating amounts and prioritizing coverage;**
- ✓ **Options for funding observer coverage; and**
- ✓ **Provisions for using service providers and authorizing waivers in specific circumstances that may prevent deployment of an observer.**

Under all of the alternatives that allocate observer coverage, limited access herring vessels will be required to comply with trip notification provisions and reporting requirements, as modified through the other proposed management measures detailed in Draft Amendment 5.

Improving and Maximizing Sampling at Sea

Q: How does the Council intend to improve sampling at sea?

A: The Council is considering six options to maximize the sampling of catch by NMFS-approved observers on board limited access Atlantic herring vessels (Categories A, B, and C). Besides taking no action, these include:

- **A Safe Sampling Station** Vessel operators would be required to provide at-sea observers

ALTERNATIVES TO ALLOCATE OBSERVER COVERAGE ON LIMITED ACCESS HERRING VESSELS.

Alternative	Priorities/targets for allocating coverage	Process for reviewing/ allocating days	Funding	Observer service providers/waivers
Alt 1: No Action: **Section 3.2.1.1**	**Cont. use of SBRM** CAI rules and A5 areas and times	**No Action**	**No Action** (Federal only, subject to resource limitations and priorities)	N/A, status quo
Alt 2: 100% Observer Coverage **Section 3.2.1.2**	**100% of declared herring trips for A/B/C vessels**	**No Action** No change to the SBRM process, plus additional days required on A/B/C vessels	**Option 1:** No Action **Option 2**: Federal and industry funds	Consistent with scallop/groundfish regs; additional option to consider states as service providers; authorization of waivers at discretion of NMFS; Council may specify instances when waivers may/may not be granted
Alt 3: Require SBRM Coverage Levels as a minimum **Section 3.2.1.3**	**SBRM-** recommended coverage levels mandated as minimum levels, reprioritizing to shift away from herring fleets CAI rules and A5 areas and times	**No Action** (SBRM)	**Same as Alt 2**	**Same as Alt 2**
Alt 4: Allocate Coverage Based On Council Targets **Section 3.2.1.4**	**30% CV* for haddock/ herring and 20% CV** on for RH catch estimates for A/B/C vessels CAI rules and A5 areas and times	**Option 1**: Supplemental NEFSC/SBRM analysis **Option 2**: Herring PDT supplemental analysis	**Same as Alt 2**	**Same as Alt 2**

with a safe sampling station adjacent to the fish deck – this could include a safety harness (if footing is compromised and grating systems are high above the deck), a safe method to obtain samples, and storage space for baskets and sampling gear.

- **Requirements for "Reasonable Assistance"** Vessel operators would be required to provide at-sea observers with reasonable assistance to enable them to carry out their duties. This could include, but is not limited to obtaining samples and sorted discards. *"Reasonable assistance" may be defined as measuring decks, codends, and holding bins; collecting bycatch when requested by the observers; and/or collecting and carrying baskets of fish when requested by the observers.*

- **Providing Notice** Vessel operators may be required to provide notice to observers when pumping begins, when to allow catch sampling and when pumping is about to end.

- **Requirements for Trips with Multiple Vessels** Observers may be required on any vessel taking on fish wherever/whenever possible, including herring trips involving more than one vessel.

- **Communication on Pair Trawl Vessels** Additional communication may be required between the boats if fish are being pumped to both vessels.

- **Visual Access to the Net/Codend** Vessel operators required to assist NMFS certified observers in obtaining visual access to the codend (or purse seine bunt) and any of its contents after pumping has ended, before the pump is removed. On trawl vessels, the codend and any remaining contents should be brought on board after pumping. If this is impossible, the vessel operator would be required to work with the observer so s/he can see the codend and its contents as clearly as possible.

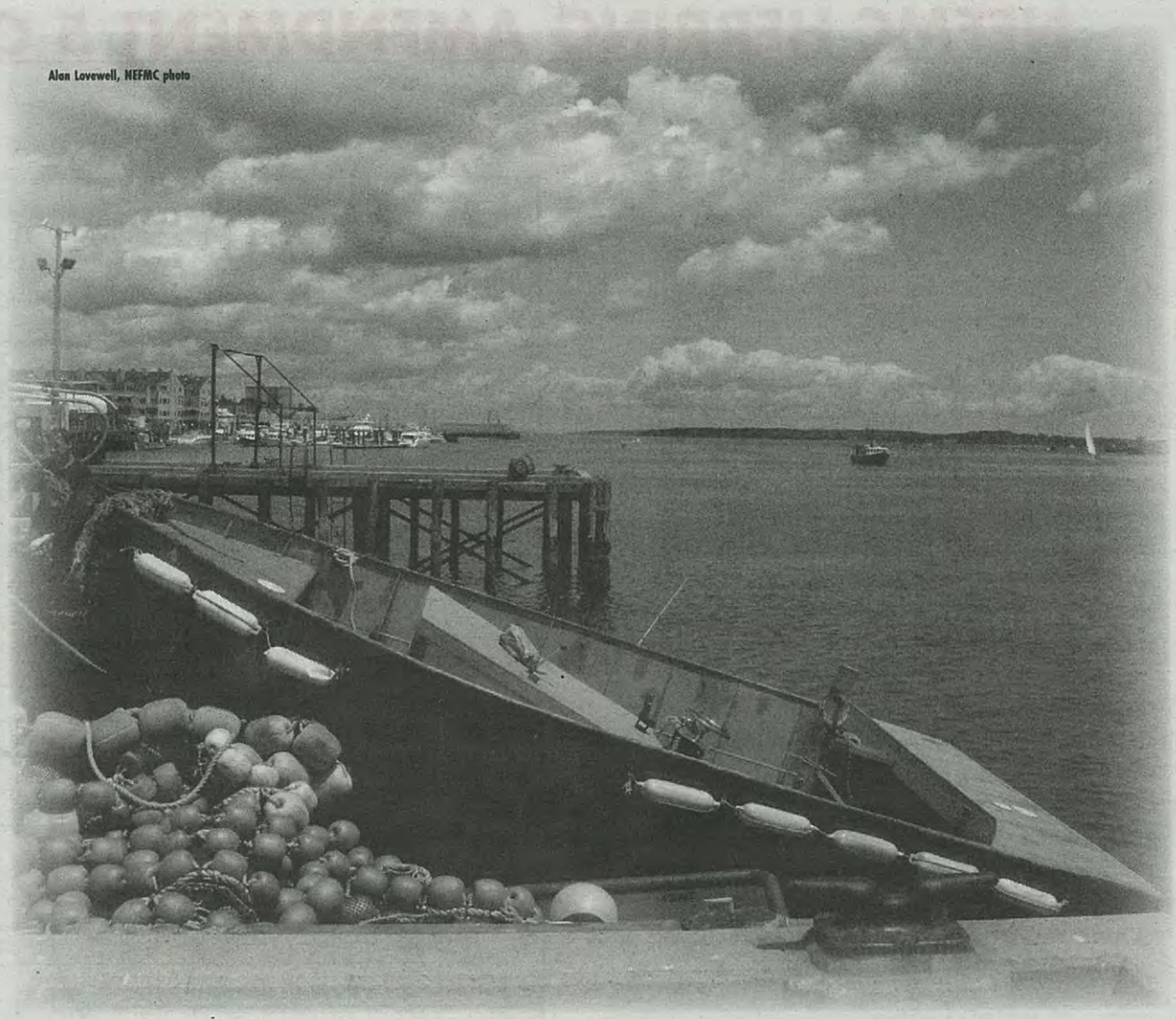
Q. Could the Council adopt any or all of these options for enhanced sampling at sea?

A. The Council could adopt any one or some combination of the six measures.

Net Slippage

Q. How does the Council define "net slippage"?

A. According to a new definition proposed in Draft Amendment 5, slippage is defined as "unobserved catch, or catch that is discarded prior to being observed, sorted, sampled, and/or brought on board the fishing vessel. Slippage can include the release of fish from a codend or seine prior to completion of pumping or the release of an entire catch or bag while the catch is still in the water." Management measures that address this issue are intended to improve the observers' ability to inspect nets after pumping to document operational discards.


Alan Lovewell, NEFMC photo

Fish that cannot be pumped and that remain in the net at the end of pumping operations are considered to be operational discards and not slipped catch. Discards that occur at-sea after the catch is brought on board and sorted are also not considered slipped catch.

Observer protocols include documenting fish that remain in the net in a discard log before they are released. Existing regulations require vessel operators to assist the observer in this process.

Q. What are the alternatives to address net slippage?

A. While a Released Catch Affidavit is currently required in Closed Area I, one of the Amendment 5 proposals calls for an affidavit that applies to trawl and purse seine vessels with Category A, B, and C herring permits on all declared herring trips with a NMFS-approved observer on board. The Released Catch Affidavit must contain detailed information and the vessel operator must sign it under penalty of perjury. Another option requires that all fish be pumped aboard for inspection and sampling by a NMFS observer. Short test tows may also be allowed without pumping the fish onboard if the test tow is retained in the net for sampling during the next pumpout.

Additional options would apply a deduction against the herring sub-annual catch limit in a management area, including Closed Area I, if a slippage event is observed and/or may require trip termination if multiple slippage events occur in one management area.

Maximized Retention

Q. What would maximized retention accomplish in the herring fishery?

A. In general, because a maximized retention (MR) program requires fishermen to land everything in the net, it has the potential to improve the calculation of catch statistics and the quantification of landed bycatch. The Council is considering a proposal that would allow NMFS to conduct an experimental fishery for four years to evaluate the appropriateness and need for a maximized retention program on all limited access herring vessels.

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NEFMC HERRING AMENDMENT 5 OVERVIEW

New England Fishery Management Council

River Herring Bycatch

Q. Why is it important to address river herring bycatch in Amendment 5?

A. River herring, which is the collective term for alewife and blueback herring, are anadromous fish that spend the majority of their adult lives at sea, but return to freshwater areas to spawn in the spring along the Atlantic coast. Both species formerly supported significant commercial and recreational fisheries that were traditionally executed in rivers, estuaries, and coastal waters using weirs, traps, dip nets and gillnets.

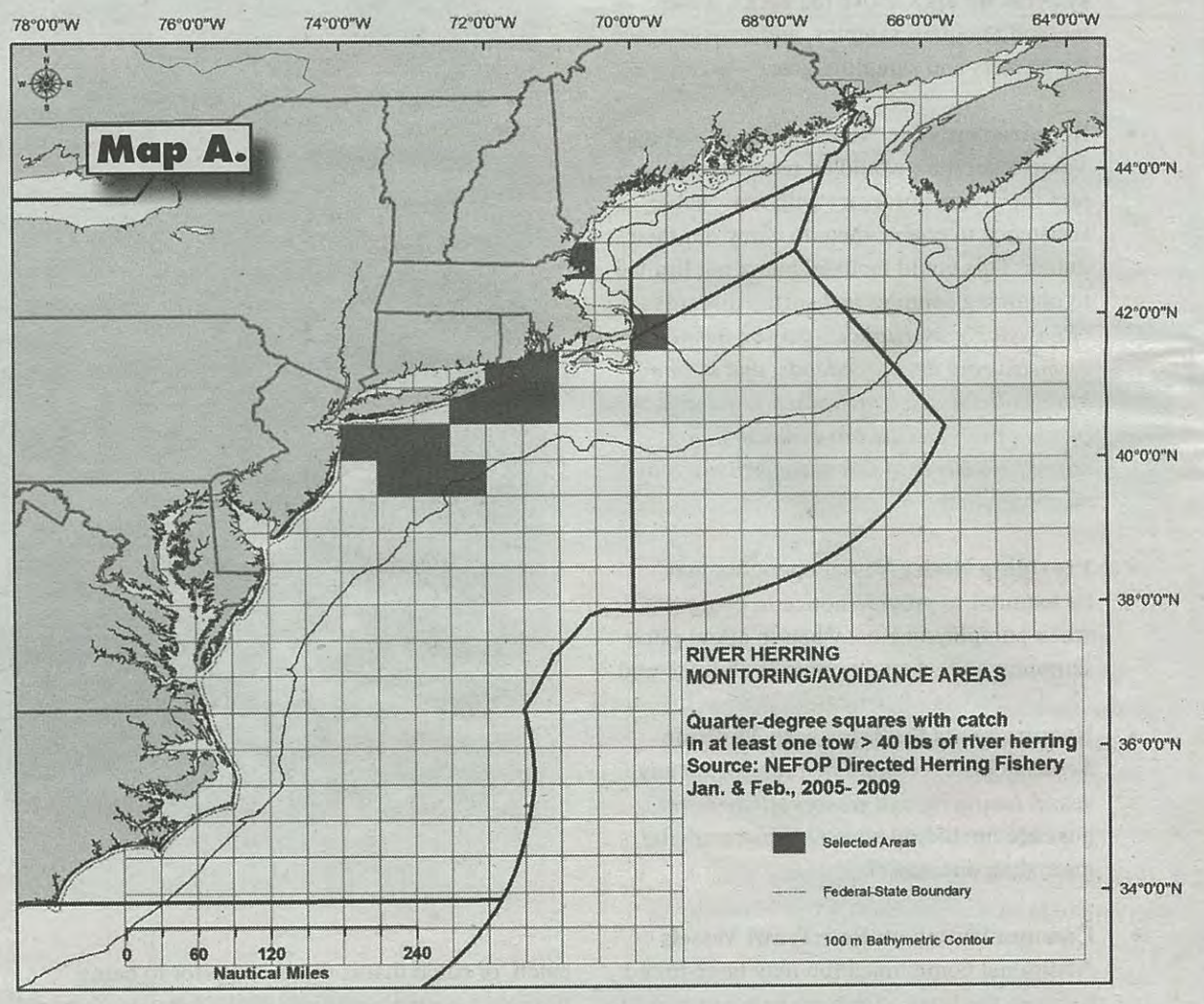
Because of the steep declines in the population abundance and the bycatch of river herring in small mesh fisheries such as Atlantic herring and others, river herring continues to be a significant concern of fishery managers. As a result, Amendment 5 proposes a range of options to address the problem.

Q. How is the Council planning to address the problem?

A. It may be helpful to look at the alternatives to address river herring as two packages of measures, each with options. One of the packages would address the concerns by establishing monitoring/avoidance areas, while another includes areas that would be closed under defined circumstances.

The first package of river herring/monitoring and avoidance measures includes stepped up monitoring of river herring bycatch and encourages bycatch avoidance in defined areas on a bimonthly basis with increased observer coverage and sampling on declared herring trips. The additional monitoring would apply during certain times and in certain areas where river herring encounters with the herring fishery were observed between 2005 and 2009.

Options call for 100% coverage of A, B and possibly C vessels or alternatively, A, B and C as well as Open Access Category D vessels. Other options include sampling protocols that are similar to the current requirements for Closed Area I and sub-options with or less than 100% observer coverage. The idea is to collect enough information to later develop strategies that target areas where interactions are observed or anticipated.



Map A. River Herring Monitoring/ Avoidance Areas for January and February only. The amendment document provides charts showing the areas that may require additional monitoring during each bi-monthly period throughout the year.

A subset of the measures described above would require additional monitoring in the bimonthly River Herring Monitoring/Avoidance Areas when a specified river herring catch trigger is reached within any of three general areas.

As shown in Map B., the trigger areas include Statistical Area 521 (Cape Cod, CC), the Gulf of Maine (GOM), and southern New England (SNE). When the catch trigger in a specified trigger area(s) is reached, one of two additional monitoring options would apply to the smaller Monitoring/Avoidance Areas for the remainder of that fishing year.

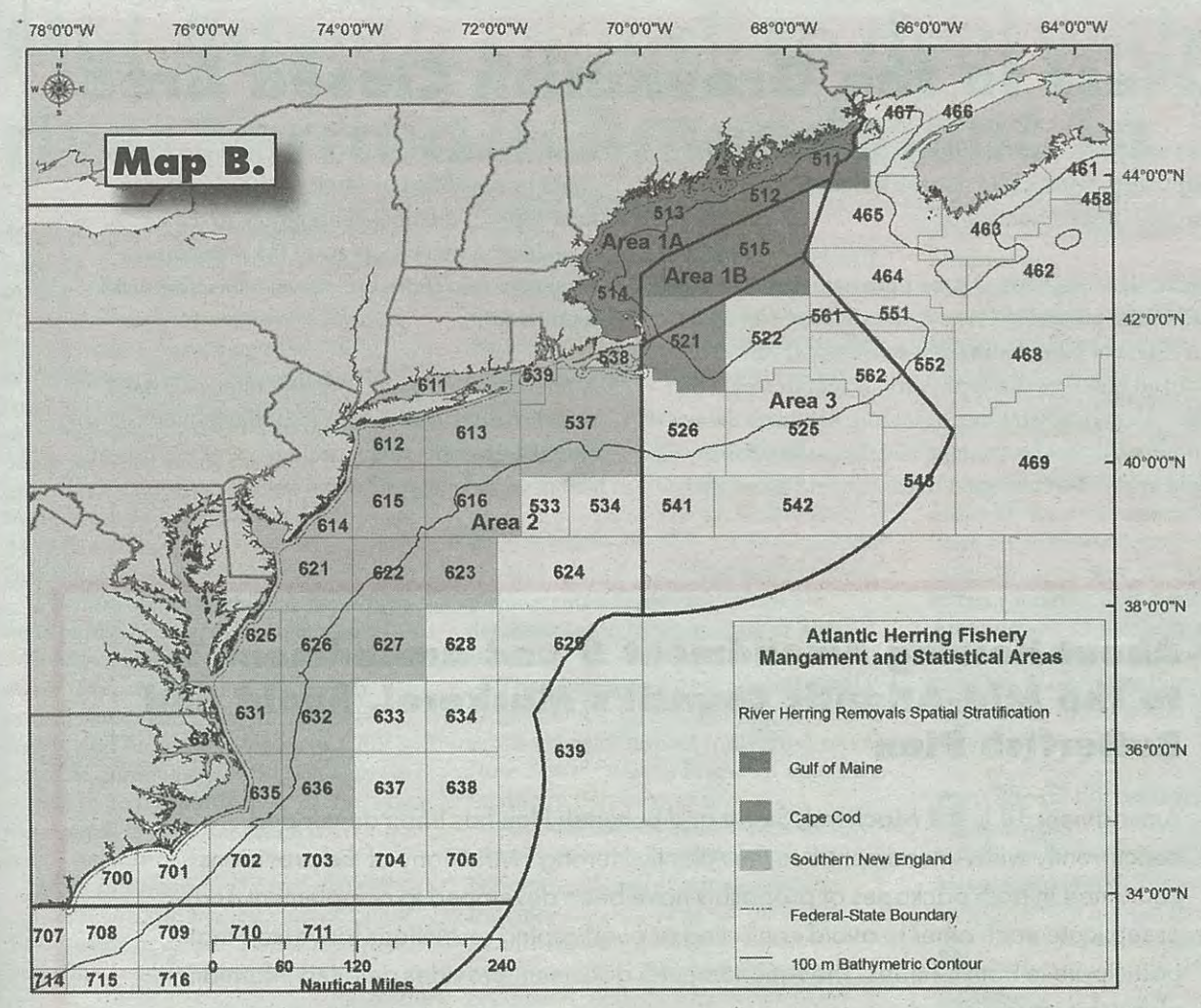
The Monitoring/Avoidance Areas associated with catch triggers mirror the areas discussed earlier and are depicted in Map A for January and February only. They will vary according to each bi-monthly map provided in the Amendment 5 document.

Map B. The three river herring catch trigger areas are shaded.

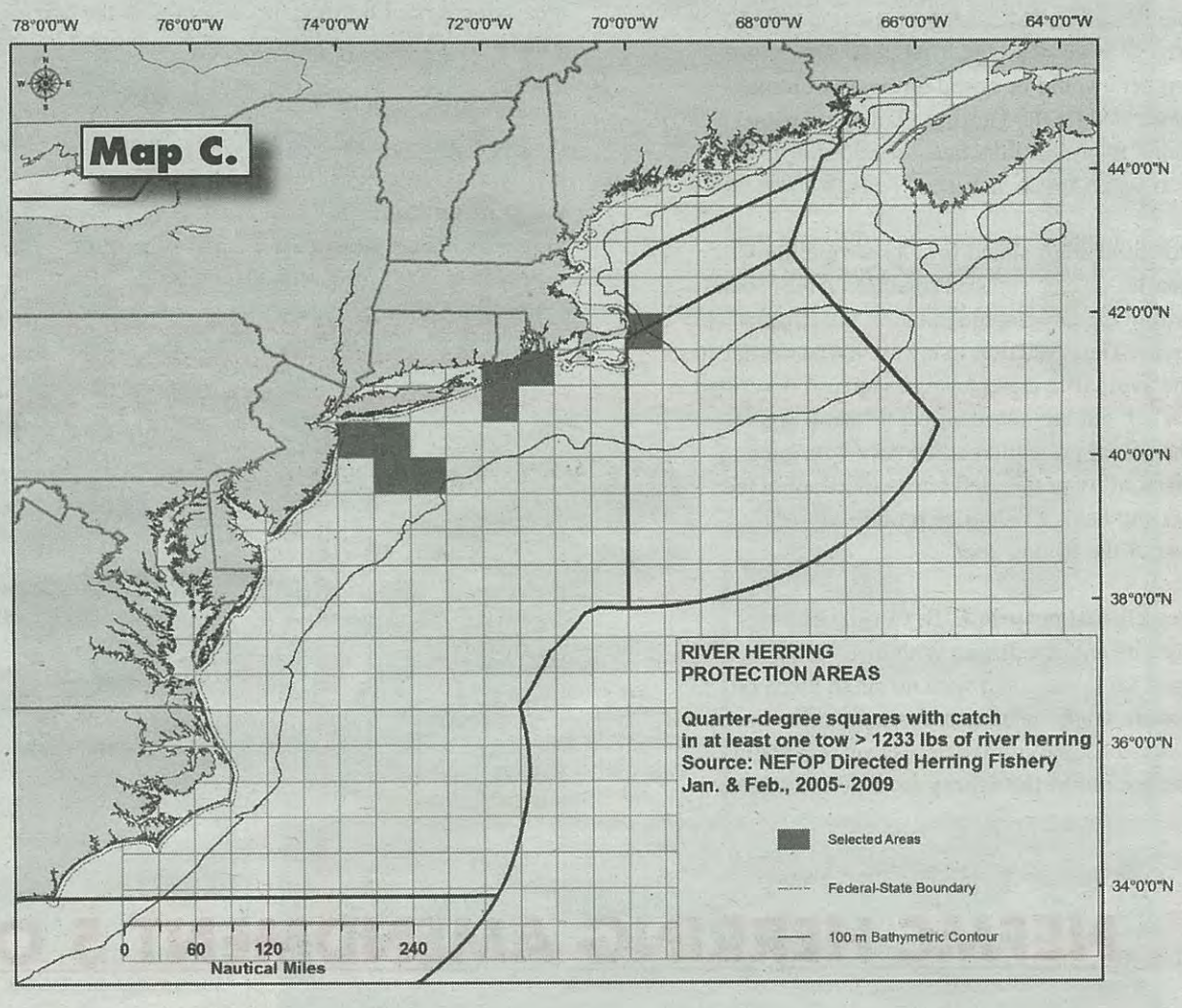
A third option uses an avoidance approach and is based on a pilot program developed in cooperation with the fishing industry, represented

Note on River Herring Catch Caps

The Council will consider establishing a river herring catch cap for the Atlantic herring fishery among the several potential measures to reduce bycatch. The catch cap would be considered by the Council through a framework adjustment to the Herring Plan or the Atlantic herring fishery specifications process once the Atlantic States Marine Fisheries Commission completes its stock assessment.



Map C. River Herring Protection Areas, January and February only. The amendment document provides additional charts showing the areas that could be closed to directed herring fishing during each bi-monthly period throughout the year.



by the Sustainable Fisheries Coalition working in partnership with Massachusetts Division of Marine Fisheries and UMASS Dartmouth School of Marine Science and Technology.

The pilot phase includes identification of bycatch avoidance areas, increased monitoring and sampling as necessary and the development of a mechanism for implementing long-term avoidance strategies. The Council has expressed support for these ongoing efforts until they are completed in late 2012. Further evaluation will take place at that time with the possibility of implementing the program through a framework adjustment to the Herring Plan.

Q. What about the proposed river herring protection areas? Do they involve actual area closures vs. increased monitoring, as described in the first package above?

A. Yes. This second package of proposals includes seasonal closures that are intended to minimize river herring bycatch in the Atlantic herring fishery. One option to accomplish this would be based on times and areas where significant river herring encounters with the fishery were observed between 2005 and 2009, according to NEFOP data. Once a threshold bycatch level is reached directed herring fishing would be prohibited in the quarter degree squares identified as River Herring Protection Areas in the Amendment 5 document. The closures would vary for each bi-monthly period during the year, and no closures would be scheduled from May through August.

Continued on next page

Midwater Trawler Access to the Groundfish Closed Areas

Four alternatives are under consideration concerning midwater trawl access to the five year-round groundfish closed areas detailed in the Northeast Multispecies (Groundfish) FMP, in addition to taking no action at all. The status quo would include the additional provisions for observer coverage and increased sampling now required in Closed Area I (based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80) as well as provisions implemented through Framework 46 to the Groundfish FMP.

The second alternative would allow the midwater trawl herring boats access to the groundfish closed areas based on provisions in effect prior to the implementation of the Closed Area I rule cited above. Herring midwater trawl vessels would be allowed to access all of the year-round groundfish closed areas without further limitations, except that the haddock catch cap and 100-pound multispecies possession limit would still apply.

The third alternative would require 100% observer coverage on single and paired trawl vessels on any trip in the year-round closed areas and pre-trip notification to NEFOP. To ensure compliance, boats could not fish without an NMFS-approved observer onboard.

Fourth, all of the Closed Area I provisions would apply to all of the groundfish closed areas on any trip made by a single or paired midwater trawler with an NMFS-approved observer onboard. Various requirements that affect pump out, sampling, releasing fish from the net if an observer is not on the boat and discarding fish at sea would apply. Test tows and releases could occur under some defined circumstances. Observer coverage could be mandated on all trips (100%), or less than 100% if distributed according to the measures contained in other sections of the Amendment 5 document (see chart on observer allocations in this supplement).

A final variation would prohibit midwater trawl vessels (single and paired) from the groundfish closed areas unless they declare out of the fishery and possess an experimental fishing permit.

About Herring Amendment 5 and Amendment 14 to the Mid-Atlantic Council's Mackerel, Squid and Butterfish Plan

Amendment 14 to the Mackerel, Squid and Butterfish Plan has been developed concurrently with Amendment 5 to the Atlantic Herring FMP. Many of the provisions contained in both packages of proposals have been developed to complement and/or replicate each other to avoid conflicting or overlapping restrictions for vessels that participate in both fisheries. The Amendment 5 document provides detailed information about this issue.

Continued from previous page

Another scenario for closing areas is predicated on catch triggers using the same trigger areas depicted in Map B. The actual triggers would be based on several options generated by the Herring Plan Development Team to produce the best estimates of river herring removals in recent years.

Potential areas slated for closure are the quarter-degree square Protection Areas found within the geographic range of the trigger areas. They function in a way that is similar to the avoidance area package scenario described earlier, but are not identical to them. Again, the actual protection areas vary with each bi-monthly period and once closed, directed herring fishing would be prohibited for the rest of the fishing year.

Vessels that possess A, B, C, or D herring permits and are fishing with mesh greater than 5.5 inches (and with no small mesh on board) would be exempt from the closed area provisions and limited access vessels could declare out of the fishery for a period of time.

Lori Steele, NEFMC photo

NEFMC HERRING AMENDMENT 5 OVERVIEW

New England Fishery Management Council

Mid-Atlantic council to deal with river herring in Amendment 14

While the New England Fishery Management Council is getting ready to address river herring bycatch concerns through Amendment 5 to its Atlantic Herring Fishery Management Plan (see council insert for details), the Mid-Atlantic Fishery Management council is considering steps to reduce the incidental catch of river herring – bluebacks and alewives – and American and hickory shad, primarily in the mackerel fishery, through Amendment 14 to its Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan.

The Mid-Atlantic council intends to hold public hearings on Amendment 14's proposed measures later this winter. Jason Didden, the council's fishery management specialist for mackerel, squid, and butterfish, provided CFN with the following question-and-answer article to help explain some of the issues the council is considering as it gets ready to finalize Amendment 14.

More information is available on the Mid-Atlantic council's Amendment 14 webpage at <www.mafmc.org/fmp/msb_files/msbAm14current.htm>.

—Editor

Q: How much river herring and shad are caught in ocean-intercept fisheries?

A: While acknowledging substantial uncertainty, the figures used by the council to develop Amendment 14 are based on 2006-2010 data. The resulting estimates indicate that, on average, about 960,000 pounds of river herring and about 120,000 pounds of shad were caught in ocean intercept fisheries during each of those years.

Ocean-intercept fish often are juveniles, so, if you assume five fish per pound, these numbers translate into around 5 million river herring and 600,000 shad being caught each year on average.

The data suggest that the mackerel and *Loligo* fisheries account for a portion of this total catch and that the mackerel fishery may have substantial encounters with river herring in some years.

Q: Are those levels of river herring and shad catch a big deal?

A: Since there are no coast-wide stock assessments for river herring or shad, it is not possible to determine if these catch levels are or are not detrimental to river herring or shad stocks.

There also are concerns that single large catches of river herring and shad could severely impact individual river runs, but very little is known about the mixing of fish runs at sea.

Amendment 14 considers a variety of ways that catch information can be improved, including mandatory, industry-funded observer coverage in both the mackerel and *Loligo* squid fisheries. As assessments are conducted, better catch information could be compared to future assessment results to determine the significance of whatever catch is occurring.

Q: How might the catch of river herring and/or shad be reduced in the Atlantic mackerel and *Loligo* squid fisheries?

A: The council is considering bycatch caps and area-based closures to reduce river herring and shad catches.

Caps would close a directed fishery once a certain amount of river herring and/or shad was caught. While one would expect some benefits from such an action, it is not currently possible to link any given catch reduction to a quantifiable benefit to river herring or shad due to the lack of assessment information.

As such, setting an annual specification cap would be difficult. But the council does deal with a similar situation in setting the butterfish cap, and the council likely would consider a variety of potential cap levels based on historical information.

Area-based closures would affect areas where river herring and shad have been caught historically. But given the wide and variable distribution of river herring and shad, analysis in Amendment 14 suggests that in order to ensure effort is not just redistributed, possibly doing more harm than good, large areas likely would have to be closed.

Q: Should the council directly manage river herring and/or shad as "stocks in the fishery" within the Atlantic Mackerel, Butterfish, and Squid Fishery Management Plan?

A: If the council added river herring and/or shad as "stocks in the fishery," then all of the relevant legal provisions that apply to any other managed stock would apply to these species, including essential fish habitat designation, federally coordinated assessments, annual catch limits, accountability measures, status determinations, rebuilding if necessary, additional observer coverage considerations, and additional coordination between the Atlantic States Marine Fisheries Commission, National Marine Fisheries Service (NMFS), regional fishery management councils, the states, and other management partners.

Amendment 14 suggests that formal council management could help river herring and shad stocks to some degree but may not be sufficient to successfully conserve any particular river run given the varied challenges these species face throughout their range and life cycle. Also, the lack of an assessment and the importance of state catches would complicate management by the council.

Q: How are the New England council and Mid-Atlantic council actions related?

A: Except for the "stock in the fishery" issue, the New England council is considering similar management measures for the Atlantic herring fishery in Amendment 5 to the Atlantic Herring Fishery Management Plan, as well as others specific to Atlantic herring. It is currently anticipated that public hearings and comment periods for both amendments will occur in March, with both councils taking action in April to submit their respective amendments to NMFS for approval. ■