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# **Review of Virginia's 2007 Striped Bass Fisheries And Monitoring Programs**

## **A Compliance Report to the Atlantic States Marine Fisheries Commission Striped Bass Technical Committee**

**June 15, 2008**

**Fisheries Management Division  
Virginia Marine Resources Commission  
2600 Washington Avenue  
Newport News, Virginia 23607**

### **I. INTRODUCTION**

The following report describes the 2007 Virginia fisheries for striped bass and includes results from fishery dependent and independent monitoring programs for striped bass in Virginia during 2007. This report also documents the 2007 compliance of Virginia with the requirements of Amendment #6 (2003) of the Atlantic States Marine Fisheries Commission (ASMFC) Interstate Fisheries Management Plan for Striped Bass (1981).

From 1990 until 2002, the VMRC was authorized by the ASMFC to manage the Coastal Area and

Chesapeake Area harvests of striped bass under one statewide quota. In May 2002 the Virginia Marine Resources Commission was required by the ASMFC to establish separate quotas for the Chesapeake Area and Coastal Area commercial fisheries. The VMRC implemented this 2-quota system in 2003, wherein both area-specific commercial striped bass fisheries are managed by an individual transferable quota system (ITQ) that allows for permanent or temporary intra-annual transfer of shares (pounds) of the respective fisheries quota. Regulation 4 VAC 20-252-10 ET SEQ. is attached to this report and contains specific management measures for these two commercial quotas.

The Coastal Area commercial quota was 174,772 pounds in 2007, as there had been a 10,081-pound overage of the 2006 quota (184,853 pounds). The 2007 Chesapeake Area commercial quota was 1,554,302 pounds, as was the recreational quota. Each Chesapeake Area quota is 1,642,242 pounds, for 2008. Recreational seasons, size limits and possession limits are detailed below.

All data tables are contained in the attached files: VA\_2007\_SBass\_Template, VA\_independent\_files\_2007 (a zip attachment), VA\_Dependent07 (a Zip Attachment).

## **II. A request for *de minimis* is not applicable.**

## **III. Previous calendar year's fishery and management program**

### **A. Fishery Dependent Monitoring Programs**

#### **i. Commercial fishery**

##### **(1) Characterization of the commercial fishery (seasons, cap, gears, regulations)**

All restrictions and conservation measures that pertained to the 2007 Virginia striped bass fisheries are detailed in Virginia Regulation 4 VAC 20-252-10 et seq. The 2007 commercial season, for the Chesapeake Area (mainstem Chesapeake Bay, its tributaries and Potomac River tributaries of Virginia), extended from February 1 through December 31, 2007. The commercial season, for the Coastal Area, extended from February 1 through December 31, 2007. This was the fifth year that separate quotas were used for Coastal Area and Chesapeake Area harvests. The Chesapeake Area quota was 1,554,302 pounds, and the 2007 harvest was 1,366,657 pounds (126,002 fish). The Coastal Area quota was 174,772 pounds, and the 2007 harvest was 165,587 pounds (14,600 fish).

Both quotas are managed by an Individual Transferable Quota (ITQ) system. In 2007 the individual shares of quota were in pounds of fish, rather than numbers of fish, as in previous years. Regulation 4 VAC 20-252-10 et seq. provides all requirements and restrictions associated with the weight-based ITQ. Permits are required to harvest striped bass, under each ITQ system, and the ITQ systems allow permitted fishermen to use any legal gear type to harvest their individual quotas (pounds of fish). Limited entry and mandatory fish-tagging programs, established

in 1992, were continued in 2007. Under the ITQ system, registered commercial fishermen may not possess more than 2 percent of the total Chesapeake Area quota or 11 percent of the Coastal Area quota.

The minimum commercial size limit was 18 inches in the Chesapeake Area and 28 inches in the Coastal Area (Virginia portion of the Federal Territorial Sea). A maximum size limit of 28 inches and complementary gill net mesh size restrictions were in effect, for the Chesapeake Area, from March 26 through June 15, 2007.

(2) Characterization of directed commercial harvest

(a) Landings and method of estimation

All permitted fishermen were required to report daily striped bass harvests, on a monthly basis, to the VMRC. All buyers of striped bass taken from Virginia tidal waters were required to submit written reports of daily purchases and sales, for each commercial fishing season, to the VMRC, no later than the 5th of the following month.

(b) Catch composition

All harvest and biological data files, age length keys and regression files that contain the raw data used to construct the catch composition are attached to this report, as part of the VA\_Dependent07 zip file. Length, weight and sex data were collected using a stratified (season, area, gear) random approach, whereas age samples were collected to provide representative samples by size (inch) intervals.

(i) Age frequency

Of the 800 striped bass (187 Coastal, 613 Chesapeake) aged by the Old Dominion University Age and Growth Laboratory, 440 (77 Coastal Area, 363 Chesapeake Area) fish were collected during the spring months (February-June); 360 (110 Coastal Area, 250 Chesapeake Area) fish were collected during the fall months (July-December). All age samples were from the 2007 Virginia commercial fisheries. Due to logistical problems with staff, the spring coastal fishery was under-sampled. The sample size does not represent the 66.4% contribution of the fishery.

An annual statewide age-length key was used for the recreational (Ocean and Inland) catch-at-age matrices. For the Chesapeake area, age-length keys were created from seasonal (January – June and July – December) length and age data, for both the pound net-haul seine and gill net-hook & line, and used for seasonal catch-at-age matrices.

All length-weight equations used in this report are included in the attached file named 2007\_VA\_Regress\_lgth\_wt\_data. Catch-at-age file can be found in VA\_2007\_SBass\_Template. Catch at age matrices generally

follow the seasonal format used for the length-weight regressions (Chesapeake pound net and haul seine, gill net and hook & line; and Coastal gill net and hook & line.

Harvests from minor gear types that were not sampled for biological data were included with the best-fit gear type, for purposes of accounting for the entire harvest, in developing the catch at age formats. Chesapeake area haul seine, fyke net, fish pot, and crab pot harvests in spring were treated as “pound net”, and accounted for 0.61% of the spring “pound net” harvest; and, haul seine, fyke net, fish pot, crab pot, and crab dredge harvests in fall were treated as “pound net”, and accounted for 10.8% of the fall pound net harvest. Coastal area hook-and-line spring and fall harvests were lumped with the respective season’s gill net harvest. The hook-and-line harvest accounted for 2% of the spring and 1.59% of the fall Coastal Area harvests.

Length-weight parameters, from 2007 samples of striped bass fisheries

Spring (February-June) gill net **and hook & line** in Virginia’s Chesapeake Area **621 GN and 3 HL** lengths & weights)  $\ln(\text{weight}) = -7.967 + 3.0488 * \ln(\text{total length})$

Fall (July-December) gill net **and hook & line** in Virginia’s Chesapeake Area (**95GN and 74 HL** lengths & weights)  $\ln(\text{weight}) = -8.2889 + 3.1088 * \ln(\text{total length})$

Spring (February-June) Pound net **and haul seine** in Virginia’s Chesapeake Area (**151 PN and 0 HS** lengths & weights)  $\ln(\text{weight}) = -7.701 + 2.9371 * \ln(\text{total length})$

Fall (July-December) Pound net in Virginia’s Chesapeake Area (**301 PN** lengths & weights)  $\ln(\text{weight}) = -8.84539 + 3.138 * \ln(\text{total length})$

Spring (February-June) Coastal Area gill net fishery in Virginia (**89 GN** lengths & weights)  $\ln(\text{weight}) = -8.4654 + 3.1824 * \ln(\text{total length})$

Fall (July-December) Coastal Area gill net **and hook & line** fishery in Virginia (**204 GN and 0 HL** lengths & weights)  $\ln(\text{weight}) = -8.0918 + 3.0432 * \ln(\text{total length})$ .

Virginia statewide recreational fishery length-weight parameters:  $\ln(\text{weight}) = -8.51409 + 3.170664 * \ln(\text{total length})$  were based on a harvest (pounds)-weighted average of the statewide (Inland and all ocean) spring and fall length-weight parameters (see attachment 1). The % of harvest (pounds) of spring (February-June) and fall (July-December), of the total 2007 statewide harvest, was used to adjust the spring- and fall-specific length-weight parameters, to arrive at a weighted set of length-weight parameters ( $\ln(\text{weight}) = -8.51409 + 3.170664 * \ln(\text{total length})$ ). There is still a poor fit of the MRFSS estimated weight and the computed (template) weight which is 1.238 times greater than the MRFSS estimates. This was the better of 2 approaches, with the other approach based on weighting length-weight parameters by area (inland, ocean) and season (spring, fall).

Coastal and Chesapeake Area age length keys are attached to this report (see EXCEL file 2007\_VA\_age-lgth\_keys).

(ii) Length frequency

Biological samples from the commercial harvest were collected at buyers' places of business or directly from pound net fishermen. A total of 1559 (293 Coastal Area, 1266 Chesapeake Area) striped bass were measured for length, and 1541 (293 Coastal, 1248 Chesapeake fish) were measured for weight. Of the samples of size characteristics, gill net harvests accounted for 56.6% of the total length sample from the Chesapeake fishery and 100% of the Coastal fishery samples of length. Statewide, gill nets accounted for 79.7% of the total length sample. Expanded length frequency data can be found in the attached worksheets contained in the file: VA\_2007\_SBass\_Template.

(iii) Sex composition

Sex information was recorded for 936 striped bass (154 Coastal Area fish, 782 Chesapeake Area fish). Statewide, 43.3% of the commercial harvest consisted of female striped bass. The sex composition of the Chesapeake Area was 36.4% female and 63.6% male, whereas field collections indicated that 77.9% of the Coastal Area commercial harvest consisted of females.

(c) Estimation of effort

A total of 442 commercial harvesters were permitted to fish for striped bass in the Chesapeake Area, at the start of the 2007 season, and 37 harvesters were permitted for harvest of striped bass from the Coastal Area at the start of the 2007 season. Since both fisheries are managed by an ITQ system that allows transfers, the number of permitted fishermen changes throughout the season. Each harvester reports effort

data for each harvest day. Additional effort or cpue information is available to the ASMFC, if needed, but the following effort information is included.

<b>Coastal System</b>		
<b>Gear</b>	<b>Pounds</b>	<b>Trips</b>
<b>Anchor Gill Net</b>	<b>147,221</b>	<b>295</b>
<b>Drift Gill Net</b>	<b>15,249</b>	<b>100</b>
<b>Hook and Line</b>	<b>3,117</b>	<b>8</b>
<b>Total</b>	<b>165,587</b>	<b>403</b>

<b>Chesapeake Bay System</b>		
<b>Gear</b>	<b>Pounds</b>	<b>Trips</b>
<b>Anchor Gill Net</b>	<b>1,098,796</b>	<b>3,036</b>
<b>Drift Gill net</b>	<b>10,449</b>	<b>38</b>
<b>Fyke net</b>	<b>4,419</b>	<b>63</b>
<b>Hook and Line</b>	<b>131,691</b>	<b>796</b>
<b>Haul Seine</b>	<b>3,908</b>	<b>23</b>
<b>Pound Net</b>	<b>87,602</b>	<b>907</b>
<b>Stake Gill Net</b>	<b>29,274</b>	<b>203</b>
<b>Fish Pot</b>	<b>105</b>	<b>91</b>
<b>Crab Pot</b>	<b>187</b>	<b>21</b>
<b>Crab Dredge</b>	<b>226</b>	
<b>Total</b>	<b>1,366,657</b>	<b>5,178</b>

ii. Recreational fishery

(1) Characterization of Recreational fishery

The 2007 and 2008 recreational fishing seasons, possession limits, and minimum and maximum possession size limits for Virginia waters, including charter boat fishing, are listed in the attached EXCEL file: VA\_2007\_SBass\_Template. Regulation 4 VAC 20-252-10 Et Seq., in effect in 2007 and 2008 are attached to this report. Virginia was allowed a trophy season, as part of a Chesapeake Bay-wide adjusted (from 30,000 fish) cap. In addition, the recreational fishing season for the Virginia Chesapeake Area has totaled 120 days, since 1997, compared to 107 days in 1996 and 1995. In 2007 Virginia observed a recreational quota of 1,554,302 pounds for the Chesapeake Bay and its tributaries and Virginia's tributaries of the Potomac River (Chesapeake Area).

(2) Characterization of directed harvest

**\*\*Virginia data remain preliminary until further notice for 2007, pending a data investigation.\*\* This note is currently posted by the NMFS on its**

**website.**

(a) Landings and method of estimation

This was the 15<sup>th</sup> consecutive year that the VMRC relied exclusively on the NMFS Marine Recreational Fisheries Statistics Survey (MRFSS) for Virginia striped bass harvest and catch estimates. In accordance with the ASMFC requirements to achieve at least a 20% PSE on harvest estimates, Virginia contracted for an expansion in the number of field intercepts and telephone surveys conducted by the NMFS. The PSE in 2007 was 10.5% for the statewide recreational fishery. Recreational landings (weight and number) and discards, for the inland fishery, ocean fishery and composite, statewide recreational fishery are listed in the attached EXCEL file: VA\_2007\_SBass\_Template. The table, below, summarizes the 2007 recreational fisheries.

<b>Area</b>	<b>Season</b>	<b>Size</b>	<b>Possession</b>
Bay & Coastal Trophy	May 1 - 15	32", Min	1 Fish
Potomac Tribs Spring	Apr 15 - May 15	28", Min	1 Fish
Chesapeake Spring*	May 16 - Jun 15	18", Min 28", max	2 Fish
Chesapeake Fall^^	Oct 4 - Dec 9	18", Min 28", max	2 Fish
Chesapeake Fall^^	Dec 10 – Dec 31	18" Min 28" Max	1 Fish
Potomac Tribs Fall^^	May 16 - Dec 31	18", Min 28", max	2 Fish
Coastal	Jan 1 - Mar 31	28", Min	2 Fish
	May 16 - Dec 31	28", Min	2 Fish

\* 1 of the 2-fish limit may be 32" or greater.  
^^1 of the 2 fish may be 34" or greater (i.e. "no-take" slot between 28 and 34")

Seventy-three trophy fish were reported (53 from charter trips and 20 from hook and line fishermen), as part of the VMRC trophy striped bass reporting program, initiated in 1995. The size of harvested fish ranged from 32 to 50.5



inches. Previously, a reporting rate of 44% was used, based on the results of a 1990-92 licensing and reporting program. Using this expansion, the estimate of the trophy harvest is 129 fish. Using an average weight of 15 pounds, the harvest estimate is 1,935 pounds. Three type 3 (weighed or measured) trophy-size fish were recorded by NMFS, for the 2007 trophy season. This is the third year, since 1995, that any trophy-size striped bass ( $\geq 32$  inches TL) were recorded by the MRFSS, for wave 3.

Information from NMFS (see file 2007\_VA\_Trophy, submitted June 15, 2007, as part of that year's compliance report) indicates that it may be more appropriate and consistent to use the VMRC mandatory reports, to assign an estimate of the trophy striped bass harvest, for 2007.

### Catch composition

#### (i) Age frequency

Commercial age samples ( 613 from the Chesapeake fisheries, 187 from Coastal fisheries) were used to calculate the recreational fisheries (inland, ocean) total weight at age and catch in numbers at age (see VA\_2007\_SBass\_Template). NMFS MRFSS was the source for recreational harvest and fork length data. Fork lengths were converted to total lengths using a regression equation, for both Coastal and Chesapeake (attached file: 2007\_fork\_to\_total\_conversion). Age-length keys (Coastal and Chesapeake) developed from the commercial samples are attached as the file: 2007\_VA\_age-length\_keys. Age-expansion of total landings is attached in file: VA\_2007\_SBass\_Template.

#### (ii) Length frequency

Expanded length frequency distributions can be found in the attached file: VA\_2007\_SBass\_Template.

#### (iii) Sex (if available)

No sex data available, from the recreational fisheries.

#### (b) Estimation of effort

The MRFSS would be the source for any specific effort trends, such as directed striped bass trips. Concerning general, total participation, the 2007 estimate of 836,063 persons ranks 5th among the last 12 years (1996- 2007). Total trips in Virginia were 3,723,442 and this number of trips (all species) ranked 3rd among the last 12 years of effort data.

#### iii. Other losses (e.g. Poaching, Hook & Release Mortality, By-catch)

The available data to estimate illegal harvest and by-catch mortality from commercial fisheries are limited. The Virginia Marine Police confiscated 4,720 pounds of striped bass in 2007, compared to 10,393 pounds in 2006; 2,598 pounds in 2005; and 7,533

pounds of striped bass in 2004. A copy of the intensive law enforcement efforts can be found in the annual ASMFC Striped Bass Enforcement Report. Using a traditional average weight (4.7 pounds), the confiscations amount to 1,005 striped bass.

Recently, most striped bass are caught by gill nets, with roughly 18% taken by other gears such as pound net, haul seine, hook and line and fyke net. It is assumed that most striped bass caught in trap nets can be released alive and do not pose a by-catch mortality problem. However, gill net fishing is widespread in Virginia and may cause substantial by-catch mortality, depending on water temperature and net soak time.

Hook-and-release mortality applies to both the recreational fisheries in Virginia and the commercial hook-and-line fishery. However, there are no estimates of released striped bass, from the commercial hook-and-line fishery. The ASMFC has specified an 8% hook-and-release mortality rate, for recreational fisheries. For the 2007 Virginia statewide recreational fisheries, 913,800 striped bass were released alive (B2s). This means the estimated hook-and-release mortality estimate is 73,104 striped bass.

iv. **Total Harvest & Losses**

<b>Summary of Striped bass losses in Virginia for 2007.</b>			
	Number	Pounds	Average Weight
<b>COMMERCIAL</b>			
Legal Harvest	140,602	1,532,244	10.9
Illegal Harvests (confiscations)	1,005	4,720	4.7
<b>RECREATIONAL AND CHARTER</b>			
Legal Harvest (all areas):			
Recreational and Charter	244,567	1,891,833	7.7
Trophy Season	129	1,935	15
Hook & Release Mortality**	73,104	312,262	4.27
<b>MONITORING</b>			
VIMS Samples	2,273	16,947	7.5
By-catch Mortality, Shad Study	2,185	9,745	4.46
<b>Totals</b>	<b>463,865</b>	<b>3,769,686</b>	<b>8.12</b>

\*\*8% of the sum of all areas B2s; see Attachment 2 (length, ALKs from MD DNR)

**B. Fishery Independent Monitoring Programs**

Table 7 and 8 of Amendment 6 stipulate that Virginia is responsible for conducting a juvenile striped bass abundance survey in the Chesapeake Bay tributaries and spawning stock biomass surveys in the Rappahannock and James rivers.

i. **Results (Complete reports, not included as attachments, are available by request)**

(1) Juvenile indices

Results from VIMS survey of juvenile striped bass relative abundance in the Virginia portion of Chesapeake Bay is attached as a file: VIMS\_jai\_annual\_report\_template\_2007.xls.

Field sampling was conducted during five approximately biweekly sampling periods from July through mid-September of 2007. During each sampling period the seine was hauled at eighteen historically sampled sites (index stations) and twenty-one auxiliary stations along the shores of the James, York and Rappahannock systems).

- (a) Index of abundance (A time series of indices of abundance and associated standard errors of means is contained in the attached EXCEL file: VIMS\_jai\_annual\_report\_template\_2007. This formatted information was requested to facilitate the stock assessment process.

The 2007 index was 11.96 and ranks 9th among 35 years of the survey.

- (b) The standard error of the mean was 0.0881

(2) Spawning stock assessment

A summary of materials and methods associated with the VIMS monitoring studies in the James and Rappahannock rivers is attached as file: Spawning\_stock\_Independent\_VIMS\_2007. Data from monitoring of gill nets in the James River extends from 1994 through 2007, while data from monitoring of Rappahannock pound nets and gill nets extends from 1991 through 2007. All associated spawning stock data requested by the ASMFC, for the annual update of the stock assessment, may be found in the attached file: VIMS\_SB\_Annual\_report\_Template6\_1991\_2007.

- (a) Mean size (length, weight) data of striped bass sampled by VIMS during monitoring studies in the Rappahannock (pound net, gill net) and James (gill net) rivers in 2007 is in an attached file: VIMS\_length\_weight\_data\_2007.
- (b) A time series of sex ratios, at age, from VIMS spring monitoring programs in the Rappahannock and James rivers, is in an attached file: VIMS\_sex\_ratio\_1991\_2007.
- (c) A time series of catch per unit of effort data, from VIMS spring monitoring programs in the Rappahannock and James rivers, is in an attached file: VIMS\_CPUE\_summary\_1991\_2007.

- (3) Stock Characterization: Not available. Seasonal monitoring and tagging programs may not satisfy a characterization of the stock.

(4) Tagging

- (a) Number of fish tagged, in spring, from the Rappahannock River, in 2007, was 1961. (see below, for earlier years):

Virginia Institute of Marine Science (VIMS)

<b>Year</b>	<b>Fall</b>	<b>Spring</b>	<b>Total</b>
2007	ND	1961	1961
2006	ND	668	668
2005	1,816	921	2,737
2004	3,434	1,655	5,089
2003	3,243	853	4,096
2002	2,895	587	3,482
2001	3,008	976	3,984
2000	3,881	1,773	5,654
1999	3,141	853	3,994
1998	3,601	785	4,386
1997	3,271	724	3,995
1996	1,440	378	1,818
1995	1,953	699	2,652
1994	2,990	195	3,185
1993	2,566	621	3,187
1992	491	1,826	2,317
1991	2,635	5,436	8,071
1990	4,308	2,601	6,909
1989	6,203	4,678	10,881
1988	3,893	4,169	8,062
1987	3,319	1,986	5,305
<b>Total</b>	<b>58,088</b>	<b>32,384</b>	<b>90,472</b>

(5) Research Removals

By-catch of striped bass and other species in 2007 (VIMS Programs): A complete report from VIMS: *Monitoring Relative Abundance of American Shad in Virginia Rivers*, is available from Dr. John E. Olney. Daily numbers and seasonal totals of striped bass and other species captured in staked gill nets can be available, upon request. In addition, other VIMS research removals of striped bass, along with associated mean length and weight data, by age, can be found within the EXCEL file: VIMS\_Stripedbass\_Monitoring\_Sacrificed\_WtandN\_byAge\_2007. Throughout the course of monitoring activities in 2007, VIMS removed 4,458 striped bass.

**IV. Planned management programs for the current calendar year**

- A. A copy of current (2008) Regulation 4 VAC 20-252-10 Et Seq., "Pertaining to Striped

Bass”, is included as an attachment.

- B. Spawning stock assessment, mark and recapture and estimation of juvenile striped bass abundance programs, as described in this report for 2007, continues in 2008.