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of the
ATLANTIC STATES MARINE
FISHERIES COMMISSION

PROCEEDINGS
OF THE 1993
STRIPED BASS
(Morone saxatilis)
STOCK ASSESSMENT
WORKSHOP

December 1993
Proceedings of the 1993
Striped Bass Stock Assessment Workshop

Edited by
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Preface

Partial funding for this project was provided by a cooperative grant between the Atlantic States Marine Fisheries Commission and the U.S. Fish and Wildlife Service through the Federal Aid in Sport Fish Restoration Program (Grant No. 14-48-0009-1256). Sport Fish Restoration Program funds were utilized by the Commission to fund travel and meeting expenses of the Striped Bass Stock Assessment Committee to facilitate stock assessment of state and federal data on Atlantic coast striped bass stocks. Figures included in this report were provided by state participants of the stock assessment workshop. This stock assessment information was summarized by the ASMFC’s Striped Bass Coordinator, funded through the ASMFC Striped Bass Monitoring and Research Coordination Project, to produce this report. We extend our appreciation to Alkon Morgan of the Atlantic States Marine Fisheries Commission for formatting and editing of data tables.
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Status of Atlantic Coast Striped Bass Stocks

1993

The status of Atlantic Coast Striped Bass stocks continues to improve. The Hudson stock retains the status of recovered, while the Chesapeake and Delaware stocks are recovering. Recent increases in the juvenile indices for the Roanoke stock point to improvement, but high mortality of spawning stock indicates that conservative management measures need to be continued if stocks are to increase overall.

The optimistic outlook for these striped bass stocks is supported by a number of indicators, the four most useful of which include 1) fishing mortality rate, 2) trends in spawning stock size, 3) juvenile production (young-of-the-year indices), and 4) trends in catch per unit effort (CPUE) of fisheries.

Fishing mortality (F) can be defined as the rate at which fish are removed from the population by fishing activities. The FMP requires that F for a transitional fishery be maintained at or below 0.25, so that spawning stock biomass is able to rebuild. Since it is difficult to determine the exact value of F occurring along the coast, values of F are calculated with a number of different methods. Calculated values of F from 1988-1992 (Table 1) indicate that it has remained within the guidelines specified in the FMP. A tagging study, currently in progress, indicates that the F value for the Chesapeake is well below the target 0.25.

Spawning stock size is defined as the size of the adult population. As with values of F, it is difficult to determine the exact size of the population. Thus, it is estimated using a number of different methods. For the Hudson River, the percentage of adults greater than 8 years old is used, and has increased steadily since 1988 (Figure 1a). In the Maryland portion of the Chesapeake Bay, the percentage of adults greater than 8 years old is also used (Figure 1b) as well as an index of spawning potential (ISP). The ISP is calculated based on the abundance of female striped bass on the spawning ground and the number of eggs produced by each fish. The index has generally shown an increasing trend since 1985 (Figure 1c). In the Pamunkey River of Virginia, estimates of egg production calculated with a method similar to that used for the ISP, have increased since 1984 (Figure 1d). A spawning stock survey for the Delaware stock has recently been instituted (Figure 1e).

Indices based on surveys of the YOY juveniles indicate recruitment success from spawning for the current year. Although the strength of these indices can be highly influenced by environmental conditions, they are very useful as indicators of potential abundance of the future stock. These indices can be misleading when used as sole source indicators of the abundance of the present spawning stock as they do not account for future fishing mortality and mortality that might result from changes in environmental and climatic conditions; they are more useful for fisheries management decisions when used in conjunction with other indicators such as the adult abundance indices presented in Figure 1. The trends of the YOY index for the Hudson, Chesapeake-Maryland, Chesapeake-Virginia, Delaware and Albemarle-Roanoke stocks are given in Figures 2a-e, respectively. The method used to calculate the Chesapeake-Maryland index has recently been changed from the arithmetic mean to the geometric mean, in order to increase the
precision of index estimates. Index values are calculated each way and included in Figure 2b. A bay-wide index is being developed for the Chesapeake which will combine the Maryland and Virginia indices (Austin et al, 1993). As expected, the indices for each stock show variable recruitment; however, each index shows a good year class over the last five years. The occurrence of good recruitment indices is consistent with the steady improvement of adult abundance indicated above. The 1993 YOY indices for Maryland and North Carolina are the highest on record, and preliminary information from the other indices indicate that the trend is coastwide.

CPUE is usually defined as the number (or weight) of fish caught in a specified period of time, which could be an hour, a day, or a 'fishing trip'. Rising CPUE suggests an increase in relative abundance of the species captured (Figure 3a). Data from the National Marine Fisheries Service's (NMFS) Marine Recreational Fishery Statistics Survey (MRFSS) from North Carolina north to Maine, show a sharp increase in CPUE for striped bass from 1989-1992 while harvest has declined since 1979 and has remained relatively low (Figure 3b) as a result of the moratoriums imposed in the mid 1980's and the conservative management measures imposed after the moratorium was lifted. CPUE for striped bass as bycatch in the Hudson River shad gillnet fishery rose steadily from 1985-1989, and remained relatively high for 1990 and 1991 (Figure 3c). The recreational fishery for striped bass in Connecticut has shown a fairly steady rise in CPUE since 1980 (Figure 3d). Commercial landings have been held to 20% of historical landings, except in Maryland, which have kept those numbers low (Figure 3e).

The current status of striped bass stocks is a result of current regulations and past moratorium. Regulations under Amendment 3 to the FMP were much more conservative than regulations under Amendment 4 which went into effect during the fall of 1989 and is presently in use. A new Amendment 5 will address a recovered fishery with a target F of 0.5, and will clarify the regulations under Amendment 4. All indicators, such as YOY indices, CPUE indices, and measured F values, imply that the fishery is well on its way to recovery. Expeditious development of Amendment 5 will ensure that a management plan will be in place when the recovery occurs.
References


Table 1. Fishing mortality (F) estimates on striped bass from the Hudson River, Maryland Rivers and from the coastal migratory stock (eastern Long Island and offshore North Carolina). Adapted from Crecco, 1992, with preliminary material from the stock assessment workshop held in Providence, RI, July 1993.

<table>
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<tr>
<th>Method</th>
<th>Location</th>
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<th>1989/90</th>
<th>Year 1990/91</th>
<th>Year 1992</th>
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<tr>
<td>Tagging</td>
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<td>&lt;0.01</td>
<td>0.41</td>
<td>0.31</td>
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<tr>
<td></td>
<td>Maryland rivers</td>
<td>0.13</td>
<td>&lt;0.01</td>
<td>0.19</td>
<td>0.175</td>
</tr>
<tr>
<td></td>
<td>Eastern Long Island</td>
<td>0.03</td>
<td>&lt;0.01</td>
<td>0.47</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Offshore North Carolina</td>
<td>&lt;0.01</td>
<td>0.48</td>
<td>0.18</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td><strong>AVERAGE</strong></td>
<td>&lt;0.01</td>
<td>0.19</td>
<td>0.29</td>
<td>0.175</td>
</tr>
<tr>
<td>Catch Curve</td>
<td>Hudson River</td>
<td>0.28</td>
<td>0.19</td>
<td>0.05</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Long Island Haul</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seine</td>
<td></td>
<td></td>
<td>0.19</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td><strong>GRAND AVERAGE</strong></td>
<td>0.04</td>
<td>0.19</td>
<td>0.23</td>
<td>0.24</td>
</tr>
</tbody>
</table>
Figure 1a. Percentage of striped bass adults age 8 or greater in the Hudson River.
Figure 1b. Percentage of striped bass adults age 8 or greater in the Maryland Chesapeake Bay.
Figure 1c. Maryland index of spawning potential for striped bass.

(*Length-based estimates*)

![Graph showing the index of spawning potential over the years from 1982 to 1991. The index shows a significant decrease from 1982 to 1985, followed by a recovery from 1985 to 1991.*]
Figure 1d. Striped bass egg production for the Pamunkey River, Virginia.
Figure 1e. Striped bass spawning stock composition, Delaware River.
**Figure 2a.** Striped bass young-of-the-year index, Hudson River.
Figure 2b. Striped bass young-of-the-year index, Chesapeake-Maryland.
Figure 2c. Striped bass young-of-the-year index, Chesapeake-Virginia.

Annual Virginia striped bass adjusted mean catch per seine haul. Vertical bars are 95% confidence intervals as estimated $\pm$ 2 standard errors of the mean.
Figure 2d. Striped bass young-of-the-year index, Delaware River.
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Figure 3a. Catch per unit effort of striped bass for the recreational fishery, Maine-North Carolina.
Figure 3b. Catch estimates of striped bass for the recreational fishery, Maine-North Carolina.
Figure 3c. Catch per unit effort of striped bass for the bycatch of the Hudson River shad gillnet fishery.
Figure 3d. Catch per unit effort of striped bass for the recreational fishery, Connecticut.
Figure 3e. Commercial landings for striped bass, Maine-North Carolina.
APPENDIX I

1990-1992 Estimated Striped Bass
Harvest in Numbers and Pounds

Prepared
by
Constance H. Young-Dubovsky
Interstate Fisheries Management Program
Atlantic States Marine Fisheries Commission
Estimated Striped Bass Harvest
in Numbers and Pounds, 1990-1992

Historically, fish landings have been reported by weight rather than by number. As a result, a record exists of harvest by weight, but not by body count. Striped bass fisheries vary by state as a result of migration and spawning patterns. Large mature fish summer off of New England, while smaller pre-migrants are found in the producer areas. The New England states catch a lot of the smaller sized fish.

The following tables were developed to document harvest by numbers of fish as well as by weight of the fish. The numbers were compiled from annual state reports submitted to the Atlantic States Marine Fisheries Commission (ASMFC) for the fishing years 1990-1992, as well as from data from the National Marine Fisheries Service's (NMFS) Marine Recreational Fishery Statistics Survey (MRFSS). The ASMFC staff plans to update the harvest report annually, and hopes that it will be useful to state and federal fisheries managers as well as the various user groups.

Please direct any questions or comments to:

Striped Bass Coordinator
Atlantic States Marine Fisheries Commission
1776 Massachusetts Ave, NW, Suite 600
Washington, DC 20036
Table 2. 1990-1992 Estimated legal recreational and commercial striped bass harvest (in numbers).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>2,939</td>
<td>0.77%</td>
<td>2,673</td>
<td>0.53%</td>
<td>11,820</td>
<td>1.58%</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>626</td>
<td>0.16%</td>
<td>300</td>
<td>0.06%</td>
<td>2,158</td>
<td>0.29%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>22,700</td>
<td>5.98%</td>
<td>39,402</td>
<td>7.84%</td>
<td>85,025</td>
<td>11.39%</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>5,321</td>
<td>1.40%</td>
<td>16,343</td>
<td>3.25%</td>
<td>25,840</td>
<td>3.46%</td>
</tr>
<tr>
<td>Connecticut</td>
<td>4,305</td>
<td>1.13%</td>
<td>8,911</td>
<td>1.77%</td>
<td>8,503</td>
<td>1.14%</td>
</tr>
<tr>
<td>New York</td>
<td>38,537</td>
<td>10.15%</td>
<td>57,860</td>
<td>11.51%</td>
<td>63,836</td>
<td>8.55%</td>
</tr>
<tr>
<td>New Jersey</td>
<td>64,556</td>
<td>17.00%</td>
<td>42,980</td>
<td>8.55%</td>
<td>43,627</td>
<td>5.84%</td>
</tr>
<tr>
<td>Delaware</td>
<td>2,536</td>
<td>0.67%</td>
<td>5,488</td>
<td>1.09%</td>
<td>5,830</td>
<td>0.78%</td>
</tr>
<tr>
<td>Maryland</td>
<td>97,080</td>
<td>25.57%</td>
<td>168,471</td>
<td>33.50%</td>
<td>351,809</td>
<td>47.11%</td>
</tr>
<tr>
<td>DC</td>
<td>96</td>
<td>0.00%</td>
<td>23</td>
<td>0.00%</td>
<td>140</td>
<td>0.02%</td>
</tr>
<tr>
<td>PRFC</td>
<td>54,313</td>
<td>14.31%</td>
<td>68,215</td>
<td>13.57%</td>
<td>63,027</td>
<td>8.44%</td>
</tr>
<tr>
<td>Virginia</td>
<td>85,373</td>
<td>22.49%</td>
<td>91,742</td>
<td>18.24%</td>
<td>81,195</td>
<td>10.87%</td>
</tr>
<tr>
<td>North Carolina</td>
<td>1,383</td>
<td>0.36%</td>
<td>456</td>
<td>0.09%</td>
<td>3,695</td>
<td>0.52%</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>379,669</td>
<td>100.00%</td>
<td>502,864</td>
<td>100.00%</td>
<td>746,705</td>
<td>100.00%</td>
</tr>
<tr>
<td>Coastwide bycatch</td>
<td>21,299</td>
<td></td>
<td>101,013</td>
<td></td>
<td>112,457</td>
<td></td>
</tr>
<tr>
<td>Coastwide H&amp;L, poach, etc.</td>
<td>128,944</td>
<td></td>
<td>207,371</td>
<td></td>
<td>527,365</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>529,912</td>
<td></td>
<td>811,248</td>
<td></td>
<td>1,386,527</td>
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</table>
Table 3. 1990-1992 Estimated recreational and commercial striped bass harvest (in pounds).

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Maine</td>
<td>73,000</td>
<td>1.94%</td>
<td>47,060</td>
<td>0.94%</td>
<td>63,913</td>
<td>0.95%</td>
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<tr>
<td>New Hampshire</td>
<td>16,000</td>
<td>0.42%</td>
<td>5,000</td>
<td>0.10%</td>
<td>43,459</td>
<td>0.64%</td>
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<tr>
<td>Massachusetts</td>
<td>551,800</td>
<td>14.65%</td>
<td>302,330</td>
<td>16.10%</td>
<td>1,525,231</td>
<td>22.61%</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>83,484</td>
<td>2.22%</td>
<td>382,368</td>
<td>7.67%</td>
<td>311,380</td>
<td>4.61%</td>
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<tr>
<td>Connecticut</td>
<td>143,100</td>
<td>3.80%</td>
<td>251,300</td>
<td>5.04%</td>
<td>173,554</td>
<td>2.57%</td>
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<tr>
<td>New York</td>
<td>689,140</td>
<td>18.30%</td>
<td>1,008,810</td>
<td>20.25%</td>
<td>1,100,973</td>
<td>16.32%</td>
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<tr>
<td>New Jersey</td>
<td>837,675</td>
<td>22.24%</td>
<td>548,000</td>
<td>13.01%</td>
<td>762,646</td>
<td>11.30%</td>
</tr>
<tr>
<td>Delaware</td>
<td>25,546</td>
<td>0.68%</td>
<td>42,188</td>
<td>0.85%</td>
<td>48,714</td>
<td>0.72%</td>
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<td>650,705</td>
<td>17.28%</td>
<td>969,497</td>
<td>19.46%</td>
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<td>DC</td>
<td>249,841</td>
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<td>340,905</td>
<td>6.84%</td>
<td>349,514</td>
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<td>PRFC</td>
<td>436,363</td>
<td>11.59%</td>
<td>478,909</td>
<td>9.61%</td>
<td>430,011</td>
<td>6.37%</td>
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<td>Virginia</td>
<td>9,797</td>
<td>0.26%</td>
<td>6,186</td>
<td>0.12%</td>
<td>31,328</td>
<td>0.46%</td>
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<tr>
<td>North Carolina</td>
<td>3,766,451</td>
<td>100.00%</td>
<td>4,982,611</td>
<td>100.00%</td>
<td>6,747,189</td>
<td>100.00%</td>
</tr>
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<td>SUBTOTAL</td>
<td>3,766,451</td>
<td>100.00%</td>
<td>4,982,611</td>
<td>100.00%</td>
<td>9,549,139</td>
<td>100.00%</td>
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<tr>
<td>Coastwide bycatch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>252,384</td>
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</tr>
<tr>
<td>Coastwide H&amp;L,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,549,566</td>
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</tr>
<tr>
<td>poach, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,766,451</td>
<td></td>
<td>4,982,611</td>
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<td>9,549,139</td>
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Table 4. 1992 Commercial and recreational quotas and actual harvest (estimated in pounds).

<table>
<thead>
<tr>
<th>STATES</th>
<th>QUOTA (lbs)</th>
<th>ACTUAL HARVEST (lbs)</th>
<th>DIFFERENCE</th>
<th>STATUS</th>
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<tbody>
<tr>
<td>Maine</td>
<td>N/A</td>
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<tr>
<td>New Hampshire</td>
<td>N/A</td>
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<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>238,000</td>
<td>239,100</td>
<td>1,100</td>
<td>OVER</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>40,400</td>
<td>39,033</td>
<td>-1,367</td>
<td>UNDER</td>
</tr>
<tr>
<td>Connecticut</td>
<td>N/A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>189,639</td>
<td>226,611</td>
<td>36,972</td>
<td>OVER</td>
</tr>
<tr>
<td>New Jersey</td>
<td>63,800</td>
<td>2,168</td>
<td>-61,632</td>
<td>UNDER</td>
</tr>
<tr>
<td>Delaware</td>
<td>23,000</td>
<td>17,795</td>
<td>-5,205</td>
<td>UNDER</td>
</tr>
<tr>
<td>Maryland (BAY)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Recreational</td>
<td>695,300</td>
<td>844,973</td>
<td>149,673</td>
<td>OVER</td>
</tr>
<tr>
<td>Charter</td>
<td>245,400</td>
<td>229,259</td>
<td>-16,141</td>
<td>UNDER</td>
</tr>
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<td>Commercial</td>
<td>695,300</td>
<td>791,210</td>
<td>95,910</td>
<td>OVER</td>
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<td>BAY TOTAL</td>
<td>1,636,000</td>
<td>1,865,442</td>
<td>229,442</td>
<td>OVER</td>
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<td>Maryland (COAST)</td>
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<td>17,770</td>
<td>-7,230</td>
<td>UNDER</td>
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<tr>
<td>DC</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PRFC</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charter</td>
<td>22,860</td>
<td>28,378</td>
<td>5,518</td>
<td>OVER</td>
</tr>
<tr>
<td>Commercial</td>
<td>155,000</td>
<td>127,398</td>
<td>-27,602</td>
<td>UNDER</td>
</tr>
<tr>
<td>PRFC TOTAL</td>
<td>177,860</td>
<td>155,776</td>
<td>-22,084</td>
<td>UNDER</td>
</tr>
<tr>
<td>Virginia</td>
<td>211,000</td>
<td>205,192</td>
<td>-5,808</td>
<td>UNDER</td>
</tr>
<tr>
<td>North Carolina</td>
<td>96,000</td>
<td>27,702</td>
<td>-68,298</td>
<td>UNDER</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,700,699</td>
<td>2,796,589</td>
<td>95,890</td>
<td></td>
</tr>
<tr>
<td>Total (Commercial)</td>
<td>1,673,339</td>
<td>1,691,811</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5. 1992 Estimated striped bass harvest (in pounds).

<table>
<thead>
<tr>
<th>STATES</th>
<th>Commercial</th>
<th>% Commer.</th>
<th>Recreational</th>
<th>Charterboat</th>
<th>Trophy</th>
<th>% Rec.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>N/A</td>
<td>0.00%</td>
<td>63,913</td>
<td></td>
<td></td>
<td>1.26%</td>
<td>63,913</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>N/A</td>
<td>0.00%</td>
<td>43,459</td>
<td></td>
<td></td>
<td>0.86%</td>
<td>43,459</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>239,100</td>
<td>14.13%</td>
<td>1,286,131</td>
<td></td>
<td></td>
<td>25.44%</td>
<td>1,525,231</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>39,033</td>
<td>2.31%</td>
<td>272,347</td>
<td></td>
<td></td>
<td>5.39%</td>
<td>311,380</td>
</tr>
<tr>
<td>Connecticut</td>
<td>N/A</td>
<td>0.00%</td>
<td>173,554</td>
<td></td>
<td></td>
<td>3.43%</td>
<td>173,554</td>
</tr>
<tr>
<td>New York</td>
<td>226,611</td>
<td>13.39%</td>
<td>874,362</td>
<td></td>
<td>2,168</td>
<td>17.30%</td>
<td>1,100,973</td>
</tr>
<tr>
<td>New Jersey</td>
<td>N/A</td>
<td>0.00%</td>
<td>760,478</td>
<td></td>
<td></td>
<td>15.09%</td>
<td>762,646</td>
</tr>
<tr>
<td>Delaware</td>
<td>17,795</td>
<td>1.05%</td>
<td>30,919</td>
<td></td>
<td></td>
<td>0.61%</td>
<td>48,714</td>
</tr>
<tr>
<td>Maryland</td>
<td>808,980</td>
<td>47.82%</td>
<td>844,973</td>
<td>229,259</td>
<td>22,834</td>
<td>21.70%</td>
<td>1,906,046</td>
</tr>
<tr>
<td>DC</td>
<td>N/A</td>
<td>0.00%</td>
<td>420</td>
<td></td>
<td></td>
<td>0.01%</td>
<td>420</td>
</tr>
<tr>
<td>PRFC</td>
<td>127,398</td>
<td>7.53%</td>
<td>193,738</td>
<td>28,378</td>
<td></td>
<td>4.39%</td>
<td>349,514</td>
</tr>
<tr>
<td>Virginia</td>
<td>205,192</td>
<td>12.13%</td>
<td>214,455</td>
<td>10,364</td>
<td></td>
<td>4.45%</td>
<td>430,011</td>
</tr>
<tr>
<td>North Carolina</td>
<td>27,702</td>
<td>1.64%</td>
<td>3,626</td>
<td></td>
<td></td>
<td>0.07%</td>
<td>31,328</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>1,691,811</td>
<td>100.00%</td>
<td>4,762,375</td>
<td>268,001</td>
<td>25,002</td>
<td>100.00%</td>
<td>6,747,189</td>
</tr>
</tbody>
</table>

Coastwide bycatch losses
Coastwide H&L, poach, sci losses
TOTAL

252,384
2,549,566
9,549,139
Table 6. 1992 Estimated striped bass harvest (in numbers).

<table>
<thead>
<tr>
<th>STATES</th>
<th>Commercial</th>
<th>% Commer.</th>
<th>Recreational</th>
<th>Charterboat</th>
<th>Trophy</th>
<th>% Rec.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>N/A</td>
<td>0.00%</td>
<td>11,820</td>
<td></td>
<td></td>
<td></td>
<td>11,820</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>N/A</td>
<td>0.00%</td>
<td>2,158</td>
<td></td>
<td></td>
<td>2.62%</td>
<td>2,158</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>11,268</td>
<td>3.82%</td>
<td>73,757</td>
<td></td>
<td></td>
<td>16.34%</td>
<td>85,025</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>5,971</td>
<td>2.02%</td>
<td>19,869</td>
<td></td>
<td></td>
<td>4.40%</td>
<td>25,840</td>
</tr>
<tr>
<td>Connecticut</td>
<td>N/A</td>
<td>0.00%</td>
<td>8,503</td>
<td></td>
<td></td>
<td>1.88%</td>
<td>8,503</td>
</tr>
<tr>
<td>New York</td>
<td>20,353</td>
<td>6.90%</td>
<td>43,483</td>
<td></td>
<td>91</td>
<td>9.63%</td>
<td>63,836</td>
</tr>
<tr>
<td>New Jersey</td>
<td>N/A</td>
<td>0.00%</td>
<td>43,536</td>
<td></td>
<td></td>
<td>9.66%</td>
<td>43,627</td>
</tr>
<tr>
<td>Delaware</td>
<td>2,704</td>
<td>0.92%</td>
<td>3,125</td>
<td></td>
<td></td>
<td>0.69%</td>
<td>5,830</td>
</tr>
<tr>
<td>Maryland</td>
<td>183,659</td>
<td>62.22%</td>
<td>128,450</td>
<td>38,686</td>
<td>1,013</td>
<td>37.24%</td>
<td>351,809</td>
</tr>
<tr>
<td>DC</td>
<td>N/A</td>
<td>0.00%</td>
<td>140</td>
<td></td>
<td></td>
<td>0.03%</td>
<td>140</td>
</tr>
<tr>
<td>PRFC</td>
<td>23,290</td>
<td>7.89%</td>
<td>33,919</td>
<td>5,818</td>
<td></td>
<td>8.80%</td>
<td>63,027</td>
</tr>
<tr>
<td>Virginia</td>
<td>44,039</td>
<td>14.92%</td>
<td>35,443</td>
<td>1,713</td>
<td></td>
<td>8.23%</td>
<td>81,195</td>
</tr>
<tr>
<td>North Carolina</td>
<td>3,886</td>
<td>1.32%</td>
<td>9*</td>
<td></td>
<td></td>
<td>0.00%</td>
<td>3,895</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>295,170</td>
<td>100.00%</td>
<td>404,213</td>
<td>46,217</td>
<td>1,104</td>
<td>100.00%</td>
<td>746,705</td>
</tr>
</tbody>
</table>

| Coastwide bycatch losses | 112,457 |
| Coastwide H&L, poach, sci losses | 527,365 |
| TOTAL                   | 1,386,527 |

* Estimated to be less than 10
Table 7. 1991 Estimated striped bass harvest (in numbers).

<table>
<thead>
<tr>
<th>STATES</th>
<th>Commercial</th>
<th>% Commer.</th>
<th>Recreational</th>
<th>Charterboat</th>
<th>Trophy</th>
<th>% Rec.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>N/A</td>
<td>0.00%</td>
<td>2673</td>
<td></td>
<td></td>
<td>0.84%</td>
<td>2,673</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>N/A</td>
<td>0.00%</td>
<td>300</td>
<td></td>
<td></td>
<td>0.09%</td>
<td>300</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>10,379</td>
<td>5.63%</td>
<td>29023</td>
<td></td>
<td></td>
<td>9.11%</td>
<td>39,402</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>2,827</td>
<td>1.53%</td>
<td>13516</td>
<td></td>
<td></td>
<td>4.24%</td>
<td>16,343</td>
</tr>
<tr>
<td>Connecticut</td>
<td>N/A</td>
<td>0.00%</td>
<td>8911</td>
<td></td>
<td></td>
<td>2.80%</td>
<td>8,911</td>
</tr>
<tr>
<td>New York</td>
<td>15,064</td>
<td>8.17%</td>
<td>42796</td>
<td></td>
<td>70</td>
<td>13.44%</td>
<td>57,860</td>
</tr>
<tr>
<td>New Jersey</td>
<td>N/A</td>
<td>0.00%</td>
<td>42910</td>
<td></td>
<td></td>
<td>13.50%</td>
<td>42,980</td>
</tr>
<tr>
<td>Delaware</td>
<td>3,091</td>
<td>1.68%</td>
<td>2397</td>
<td></td>
<td></td>
<td>0.75%</td>
<td>5,488</td>
</tr>
<tr>
<td>Maryland</td>
<td>63,148</td>
<td>34.24%</td>
<td>75059</td>
<td>29,928</td>
<td>336</td>
<td>33.08%</td>
<td>168,471</td>
</tr>
<tr>
<td>DC</td>
<td>N/A</td>
<td>0.00%</td>
<td>23</td>
<td></td>
<td></td>
<td>0.01%</td>
<td>23</td>
</tr>
<tr>
<td>PPRC</td>
<td>44,522</td>
<td>24.14%</td>
<td>20984</td>
<td>2,709</td>
<td></td>
<td>7.44%</td>
<td>68,215</td>
</tr>
<tr>
<td>Virginia</td>
<td>44,970</td>
<td>24.38%</td>
<td>45155</td>
<td>1,617</td>
<td></td>
<td>14.69%</td>
<td>91,742</td>
</tr>
<tr>
<td>North Carolina</td>
<td>447</td>
<td>0.24%</td>
<td>9*</td>
<td></td>
<td></td>
<td>0.00%</td>
<td>456</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>184,448</td>
<td>100.00%</td>
<td>283756</td>
<td>34,254</td>
<td>406</td>
<td>100.00%</td>
<td>502,864</td>
</tr>
</tbody>
</table>

Coastwide bycatch losses
Coastwide H&L, poach, SCI losses
TOTAL

* - Estimated to be less than 10
### TABLE 8. 1990 Estimated striped bass harvest (in numbers).

<table>
<thead>
<tr>
<th>STATES</th>
<th>Commercial</th>
<th>% Commer.</th>
<th>Recreational</th>
<th>Charterboat</th>
<th>Trophy</th>
<th>% Rec.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>N/A</td>
<td>0.00%</td>
<td>2,939</td>
<td></td>
<td></td>
<td>1.21%</td>
<td>2,939</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>N/A</td>
<td>0.00%</td>
<td>626</td>
<td></td>
<td></td>
<td>0.26%</td>
<td>626</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>6,300</td>
<td>4.60%</td>
<td>16,400</td>
<td></td>
<td></td>
<td>6.75%</td>
<td>22,700</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>252</td>
<td>0.18%</td>
<td>5,069</td>
<td></td>
<td></td>
<td>2.09%</td>
<td>5,321</td>
</tr>
<tr>
<td>Connecticut</td>
<td>N/A</td>
<td>0.00%</td>
<td>4,305</td>
<td></td>
<td></td>
<td>1.77%</td>
<td>4,305</td>
</tr>
<tr>
<td>New York**</td>
<td>11,785</td>
<td>8.61%</td>
<td>26,752</td>
<td></td>
<td></td>
<td>11.02%</td>
<td>38,537</td>
</tr>
<tr>
<td>New Jersey</td>
<td>N/A</td>
<td>0.00%</td>
<td>64,556</td>
<td></td>
<td></td>
<td>26.59%</td>
<td>64,556</td>
</tr>
<tr>
<td>Delaware</td>
<td>612</td>
<td>0.45%</td>
<td>1,924</td>
<td></td>
<td></td>
<td>0.79%</td>
<td>2,536</td>
</tr>
<tr>
<td>Maryland</td>
<td>22,951</td>
<td>16.77%</td>
<td>59,930</td>
<td>14,199</td>
<td></td>
<td>30.53%</td>
<td>97,080</td>
</tr>
<tr>
<td>DC</td>
<td>N/A</td>
<td>0.00%</td>
<td></td>
<td></td>
<td></td>
<td>0.00%</td>
<td>0</td>
</tr>
<tr>
<td>PRFC</td>
<td>36,752</td>
<td>26.86%</td>
<td>13,604</td>
<td>3,957</td>
<td></td>
<td>7.23%</td>
<td>54,313</td>
</tr>
<tr>
<td>Virginia</td>
<td>56,827</td>
<td>41.52%</td>
<td>27,145</td>
<td>1,401</td>
<td></td>
<td>11.76%</td>
<td>85,373</td>
</tr>
<tr>
<td>North Carolina</td>
<td>1,374</td>
<td>1.00%</td>
<td></td>
<td>9*</td>
<td></td>
<td>0.00%</td>
<td>1,383</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td>136,853</td>
<td>100.00%</td>
<td>223,259</td>
<td>19,557</td>
<td></td>
<td>100.00%</td>
<td>379,669</td>
</tr>
</tbody>
</table>

Coastwide bycatch losses
Coastwide H&L, poach, sci losses
TOTAL

* - Estimated to be less than 10
** Hudson River not included in H&L mortality or poaching
APPENDIX II

1993 Atlantic Coast Striped Bass

Recreational and Commercial

Harvest Regulations

Prepared by
Constance H. Young-Dubovsky
Interstate Fisheries Management Program
Atlantic States Marine Fisheries Commission
## RECREATIONAL HARVEST REGULATIONS

### Atlantic Coast Striped Bass 1993

<table>
<thead>
<tr>
<th>STATE</th>
<th>SIZE LIMITS</th>
<th>DAILY BAG LIMITS</th>
<th>SEASONAL QUOTA (LBS)</th>
<th>SEASON</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME</td>
<td>36&quot; min</td>
<td>1</td>
<td>none</td>
<td>Bay and Rivers: 01 June 93 - 30 Apr 94 (Catch &amp; release only)</td>
</tr>
<tr>
<td>NH</td>
<td>36&quot; min</td>
<td>1</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>MA</td>
<td>36&quot; min</td>
<td>1</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>RI</td>
<td>28&quot; min</td>
<td>1</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>CT</td>
<td>36&quot; min</td>
<td>1</td>
<td>none</td>
<td>01 Apr - 14 Dec</td>
</tr>
<tr>
<td>NY</td>
<td>Hudson River: 18&quot; min</td>
<td>1</td>
<td>none</td>
<td>Hudson River: 15 Mar - 30 Nov Ocean: 08 May - 15 Dec</td>
</tr>
<tr>
<td></td>
<td>Ocean: 36&quot; min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NJ</td>
<td>Delaware Bay and River: 36&quot; min</td>
<td>1</td>
<td>(trophy fishery from commercial cap of 63,800 lbs)</td>
<td>Delaware Bay and River: 01 Mar - 31 Mar 01 Apr 31 May (C&amp;C canal to ocean only)</td>
</tr>
<tr>
<td></td>
<td>Other Rivers: 26&quot; min</td>
<td>1</td>
<td>Trophy: 1/day in addition to regular fishery</td>
<td>01 Jun - 31 Dec Other Rivers: 01 Mar - 31 Dec Ocean: none</td>
</tr>
<tr>
<td></td>
<td>Ocean: 28&quot; min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>38&quot; min trophy program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>36&quot; min</td>
<td>1</td>
<td>none</td>
<td>Delaware River: 01 - 31 Mar 01 Jun - 31 Dec.</td>
</tr>
<tr>
<td>DE</td>
<td>28&quot; min</td>
<td>1</td>
<td>none</td>
<td>spawning area closure: 01 Apr - 31 May</td>
</tr>
<tr>
<td>MD</td>
<td>Bay &amp; River: 18&quot; min</td>
<td></td>
<td>Bay &amp; River: 892,500(rec) 315,000 (charter)</td>
<td>Bay &amp; River: 01 Oct - 21 Nov (rec) 01 Oct - 21 Nov (charter)</td>
</tr>
<tr>
<td></td>
<td>Trophy: 36&quot; min</td>
<td></td>
<td>Trophy: 1/season</td>
<td>Trophy: 01 - 31 May</td>
</tr>
<tr>
<td></td>
<td>Ocean: 28&quot; min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRFC</td>
<td>36&quot; min</td>
<td>1</td>
<td>none</td>
<td>spawning area closure: 01 Apr - 31 May</td>
</tr>
<tr>
<td>DC</td>
<td>18&quot; min 36&quot; max</td>
<td>1</td>
<td>none</td>
<td>07 June - 30 Nov</td>
</tr>
<tr>
<td>VA</td>
<td>Bay &amp; River: 18&quot; min</td>
<td></td>
<td>Bay &amp; River: 892,500(rec) 315,000 (charter)</td>
<td>Bay &amp; River: 28 Oct - 16 Dec (Th - Su only)</td>
</tr>
<tr>
<td></td>
<td>36&quot; max</td>
<td></td>
<td></td>
<td>Ocean: Same as Bay &amp; River</td>
</tr>
<tr>
<td></td>
<td>Ocean: 28&quot; min 36&quot; max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NC</td>
<td>Sounds &amp; Rivers: 18&quot; min</td>
<td></td>
<td>Albenmarle Sound &amp; Roanoke: 3 (It waters) 3 (inland Roanoke) 67,000 lbs (all waters)</td>
<td>Albenmarle Sound: 01 Jan - 31 Mar (It waters) 01 Apr - 31 May or 29,000lbs (inland Roanoke)</td>
</tr>
<tr>
<td></td>
<td>Roanoke: no fish between 22&quot; - 27&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ocean: 28&quot; min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STATE</td>
<td>SIZE LIMITS</td>
<td>CAP (in lbs.)</td>
<td>SEASON</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td>---------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>ME</td>
<td>no fishery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH</td>
<td>no fishery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA</td>
<td>36&quot; min</td>
<td>238,000</td>
<td>01 July - 30 Sept</td>
<td></td>
</tr>
<tr>
<td>RI</td>
<td>40&quot; min (H &amp; L) 18&quot; min 28&quot; max (trap net)</td>
<td>40,400</td>
<td>01 Jan - 06 July</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td>no fishery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NY</td>
<td>24&quot; min 36&quot; max</td>
<td>184,684</td>
<td>01 July - 15 Dec</td>
<td></td>
</tr>
<tr>
<td>NJ</td>
<td>no fishery</td>
<td>(63,800 allocated to rec fishery)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>no fishery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>18&quot; min 28&quot; max</td>
<td>33,867</td>
<td>01 Mar - 30 Apr (closed Apr to 31 May on spawning grounds)</td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>Bay &amp; River: 18&quot; min Ocean: 28&quot; min</td>
<td>Bay: 892,500 Ocean: 25,000</td>
<td>Bay: 15 Sep - 12 Nov (pound nets, haul seines) 15 Nov - 07 Dec (hook and line) 01 Dec - 22 December and 03 Jan '94 to 28 Feb '94 (gillnet and trawls) Ocean: 01 Dec - 22 Dec 03 Jan '94 - 28 Feb '94</td>
<td></td>
</tr>
<tr>
<td>PRFC</td>
<td>18&quot; min 28&quot; max</td>
<td>177,860</td>
<td>Various days between 04 Aug - 16 Dec Tagging requirements same as in 1992</td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>no fishery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td>Bay &amp; River: 18&quot; min 36&quot; max Ocean: 28&quot; min 36&quot; max</td>
<td>211,000</td>
<td>15 Sept - 31 Dec</td>
<td></td>
</tr>
<tr>
<td>NC</td>
<td>Albemarle Roanoke: no fish between 22&quot; - 27&quot; Ocean: 28&quot; min</td>
<td>Albemarle Sound: 98,000 (3 fish/day in Winter) Ocean: 96,000</td>
<td>Albemarle Sound: 01 Jan - 05 Apr Ocean: 01 Jan - 31 Mar and 01 Dec - 31 Dec</td>
<td></td>
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</tbody>
</table>