

# Atlantic States Marine Fisheries Commission

## Atlantic Striped Bass Management Board

*October 23, 2012  
1:45 – 2:45 p.m.  
Philadelphia, Pennsylvania*

### Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*T. O'Connell*) 1:45 p.m.
2. Board Consent 1:45 p.m.
  - Approval of Agenda
  - Approval of Proceedings from August 7, 2012
3. Public Comment 1:50 p.m.
4. Consider benchmark stock assessment Terms of Reference (*A. Sharov*) **Action** 2:00 p.m.
5. Rhode Island Addendum III Request (*B. Ballou*) **Action** 2:15 p.m.
6. Consider 2012 FMP Review (*K. Taylor*) **Action** 2:30 p.m.
7. Other Business/Adjourn 2:45 p.m.

The meeting will be held at the Radisson Plaza Warwick Hotel 220 South 17th Street, Philadelphia, PA (215) 735-6000

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

# MEETING OVERVIEW

**Atlantic Striped Bass Management Board Meeting**  
**October 23, 2012**  
**1:45 – 2:45 p.m.**  
**Philadelphia, Pennsylvania**

Chair: Tom O’Connell (MD) Assumed Chairmanship: 02/12	Technical Committee Chair: Alexei Sharov (MD)	Law Enforcement Committee Rep: Kurt Blanchard (RI)
Vice Chair: Dour Grout	Advisory Panel Chair: Kelly Place (VA)	Previous Board Meeting: August 7, 2012
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, NMFS, USFWS (16 votes)		

## 2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 7, 2012

**3. Public Comment** – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

<b>4. Consider benchmark stock assessment Terms of Reference (2:00 – 2:15 p.m.) Action</b>
<p><b>Background</b></p> <ul style="list-style-type: none"> <li>• In August the Technical Committee, Tagging Subcommittee, and Stock Assessment Subcommittee met to develop the Terms of Reference for the 2013 Benchmark Stock Assessment.</li> <li>• The stock assessment will be peer reviewed June 2013 at SAW 56. Following the SAW/SARC process the Terms of Reference were submitted to the Northeast Regional Coordinating Council for their review and approval in September (<b>Briefing CD</b>).</li> </ul>
<p><b>Presentations</b></p> <ul style="list-style-type: none"> <li>• Overview of Terms of Reference by A. Sharov.</li> </ul>
<p><b>Board actions for consideration at this meeting</b></p> <ul style="list-style-type: none"> <li>• Approval of Terms of Reference</li> </ul>

<b>5. Rhode Island Addendum III Request (2:15 – 2:30 p.m.) Action</b>
<b>Background</b> <ul style="list-style-type: none"> <li>• Rhode Island has submitted a request to the Board that the date of submission for the Striped Bass Commercial Tagging Report, as required under Addendum III, be changed from November 1<sup>st</sup> to January 1<sup>st</sup> (<b>Briefing CD</b>).</li> </ul>
<b>Presentations</b> <ul style="list-style-type: none"> <li>• Review of Rhode Island Request by B. Ballou</li> </ul>
<b>Board Actions for Consideration</b> <ul style="list-style-type: none"> <li>• Approval of Rhode Island request</li> </ul>

<b>6. 2012 FMP Review (2:00 – 2:15 p.m.) Action</b>
<b>Background</b> <ul style="list-style-type: none"> <li>• State Compliance Reports are due on June 15, 2012 (<b>Briefing CD</b>).</li> <li>• The Plan Review Team reviewed each state report and compiled the annual FMP Review</li> </ul>
<b>Presentations</b> <ul style="list-style-type: none"> <li>• Overview of the FMP Review by K. Taylor</li> </ul>
<b>Board actions for consideration at this meeting</b> <ul style="list-style-type: none"> <li>• Approve 2010 FMP Review and State Compliance Report.</li> </ul>

**6. Other Business/Adjourn**

**DRAFT**

**DRAFT**

**DRAFT**

**DRAFT PROCEEDINGS OF THE  
ATLANTIC STATES MARINE FISHERIES COMMISSION  
ATLANTIC STRIPED BASS MANAGEMENT BOARD**

**Crowne Plaza Hotel - Old Town**  
Alexandria, Virginia  
August 7, 2012

**These minutes are draft and subject to approval by the Striped Bass Management Board.  
The Board will review the minutes during its next meeting.**

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**Adjournment ..... 20**

These minutes are draft and subject to approval by the Striped Bass Management Board.  
The Board will review the minutes during its next meeting.

## INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of May 1, 2012** by consent (Page 1).
3. **Move to approve Option 2 for Section 3.1, Commercial Tag and Program Implementation** (Page 4). Motion by Pat Augustine; second by Tom Fote. Motion carried (Page 5).
4. **Move to approve Option 1 under Category A** (Page 5). Motion by A.C. Carpenter; second by Rick Bellavance. Motion carried (Page 9).
5. **Move to approve Option 2, Suboption A for Category B** (Page 10). Motion by Ritchie White; second by Pat Augustine. Motion carried (Page 13).
6. **Move to substitute to approve Option 1 for Category B** (Page 12). Motion by Paul Diodati; second by Rick Bellavance. Motion carried as the main motion (Page 13).
7. **Move to approve Option 2 under Category C** (Page 13). Motion by A.C. Carpenter; second by Pat Augustine. Motion carried (Page 13).
8. **Move to approve approve Option 2 under Category D** (Page 13). Motion by Pat Augustine; second by Roy Miller. Motion carried (Page 14).
9. **Move to adopt Option 2 under Category E** (Page 14). Motion by Pat Augustine; second by Rob O'Reilly. Motion carried (Page 14).
10. **Move to approve Option 2 under Category F** (Page 14). Motion by Pat Augustine; second by Russ Allen. Motion carried (Page 16).
11. **Move to approve Option 2 under Category G** (Page 16). Motion by Pat Augustine; second by Russ Allen. Motion carried (Page 16).
12. **Move to include Section 3.2, penalty recommendations to the states** (Page 16). Motion by Pat Augustine; second by Loren Lustig. Motion carried (Page 16).
13. **Move to implement measures adopted in Addendum III by the opening of the commercial fishing season in each state in 2013 with the exception that Massachusetts and North Carolina must be implemented by January 1, 2014** (Page 17). Motion by Pat Augustine; second by A.C. Carpenter. Motion carried (Page 17).
14. **Move to accept Addendum III to the ISFMP for Striped Bass** (Page 17). Motion by Pat Augustine; second by Bill Adler. Motion carried (Page 19).
15. **Motion to extend the beginning of the Virginia commercial striped bass season from February 1<sup>st</sup> to January 16<sup>th</sup>** (Page 20). Motion by James Gilmore; second by Bill Cole. Motion carried (Page 20).
16. **Move to nominate Mike Celestino to the Striped Bass Stock Assessment Subcommittee** (Page 20). Motion by Russ Allen; second by Pat Augustine. Motion carried (Page 20).
17. **Motion to adjourn** by consent (Page 20).

**ATTENDANCE****Board Members**

Steve Train, ME (GA)	Adam Nowalsky, NJ, proxy for Asm. Albano (LA)
G. Ritchie White, NH (GA)	Leroy Young, PA, proxy for J. Arway (AA)
Doug Grout, NH (AA)	Loren Lustig, PA (GA)
Rep. David Watters, NH (LA)	Bernie Pankowski, DE, proxy for Sen. Venables (LA)
Rep. Sarah Peake, MA (LA)	Roy Miller, DE (GA)
Paul Diodati, MA (AA)	Tom O'Connell, MD (AA)
Bill Adler, MA (GA)	Russell Dize, MD, proxy for Sen. Colburn (LA)
Robert Ballou, RI (AA)	Bill Goldsborough, MD (GA)
Bill McElroy, RI (GA)	Rob O'Reilly, VA, proxy for J. Travelstead (AA)
Rick Bellavance, RI, proxy for Rep. Peter Martin (LA)	Cathy Davenport, VA (GA)
David Simpson, CT (AA)	Kyle Schick, VA, proxy for Sen. Stuart (LA)
Lance Stewart, CT (GA)	Bill Cole, NC (GA)
James Gilmore, NY (AA)	Michelle Duval, NC, proxy for L. Daniel (AA)
Brian Culhane, NY, proxy for Sen. Johnson (LA)	A.C. Carpenter, PRFC
Pat Augustine, NY (GA)	Dan Ryan, DC
Russ Allen, NJ, proxy for D. Chanda (AA)	Steve Meyers, NMFS
Tom Fote, NJ (GA)	Jaime Geiger, USFWS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

**Ex-Officio Members**

Alexei Sharov, Technical Committee Chair

Kelly Place, Advisory Panel Chair

**Staff**

Robert Beal  
Kate Taylor

Mike Waine

**Guests**

Wilson Laney, US FWS  
Bob Ross, NMFS  
Charles Lynch, NOAA  
Peter Himchak, NJ DFW  
Ross Self, SC DNR  
Andrew Turner, NOAA  
Adam Davis, Chesapeake Research Consortium  
Jeff Kaelin, Lund's Fisheries  
Matt Cieri, ME DMR

Jud Crawford, Pew Charitable Trusts  
Fred Akers, Great Egg Harbor River Council  
Lindsey Fullenkamp, NOAA  
Ken Hastings, Mason Springs Conservancy  
John Pedrick, Philadelphia, PA  
Lloyd Ingerson, MD NR Police  
Raymond Kane, CHOIR  
Patrick Paquette, MA SBA

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened in the Presidential Ballroom of the Crowne Plaza Hotel, Alexandria, Virginia, August 7, 2012, and was called to order at 2:15 o'clock p.m. by Chairman Tomas O'Connell.

### CALL TO ORDER

CHAIRMAN THOMAS O'CONNELL: Good afternoon, everyone. My name is Tom O'Connell and I will be chairing the Striped Bass Management Board Meeting today. I would like to call the meeting to order and welcome everybody.

### APPROVAL OF AGENDA

CHAIRMAN THOMAS O'CONNELL: Everyone should have a copy of the agenda, and the first order of business is to approve the agenda.

There is one modification that we will add between five and six. That will be to consider adding membership to the stock assessment committee. Are there any other modifications that the board would like to consider at this time? Seeing none, the agenda will stand approved as modified.

### APPROVAL OF PROCEEDINGS

CHAIRMAN THOMAS O'CONNELL: The second item on our agenda is approval of our proceedings from May 1, 2012. Are there any modifications to be requested from those proceedings? Seeing none, those proceedings will stand approved.

Before we get into the public comment, just to kind of provide a broad overview of our agenda today, it focuses on Draft Addendum III, which the board initiated in February of this year with the focus on law enforcement following forward with the recommendations from the Interstate Watershed Task Force. Today's agenda is focused on hearing what the public had to say about that draft addendum and taking final action.

We also have a request from Virginia for an alternative management and an addition of a stock assessment committee membership.

### PUBLIC COMMENT

CHAIRMAN THOMAS O'CONNELL: At this point in time is there anybody from the public that would like to provide comment to the board on items that are not on the agenda? Mr. Price, do you want to come up to the microphone?

MR. JAMES PRICE: My name is James Price, and I am President of the Chesapeake Bay Ecological Foundation. Thank for the opportunity to speak. I felt obligated to inform the commission about an important discovery concerning striped bass mortality in the Maryland section of the Chesapeake Bay.

I was unable to distribute the final copies of my summary and charts before the meeting. However, you have been given some copies today. For years no one has been able to explain with any certainty why striped bass appear to be dying from increased natural mortality in the Chesapeake Bay. Over the past several weeks a number of events have taken place that have helped answer the question. Copies of the explanation, including charts, will be soon available on the Chesapeake Bay Ecological Foundation's Website.

I presented this information to an ASMFC Striped Bass Technical Committee Workshop last week in Philadelphia. Ongoing research by the Chesapeake Bay Ecological Foundation has determined that the male-to-female sex ratio of striped bass in the 18 to 28-inch range has dramatically declined in the Maryland section of the Chesapeake Bay since 2010, indicating that male striped bass are experiencing a much higher natural mortality rate than female striped bass of similar age.

This disparity results from divergent ages at sexual maturity. The males are about two to three and females five to eight. Visceral fat in the abdominal cavity accumulated by striped bass when feeding primarily on fish, predominantly menhaden, during late fall and winter is utilized for gonadal development prior to spawning in the spring.

Therefore, in order to sustain normal physiological functions, including growth, larger post-spawning males over 18 inches must replenish their visceral fat during late spring before summer temperatures limits their success in capturing prey fish. During summer prey fish consumption is minimal and bottom-dwelling prey dominates their diet.

With current depletion of prey fish in the Upper Bay, particularly sub-adult menhaden less than ten inches and adult bay anchovy, post-spawning males cannot adequately replenish their fat reserves and therefore are vulnerable to malnutrition, disease and increased mortality. Since immature female striped bass don't spawn, accumulated winter fat is not depleted.

Consequently, these fat reserves help sustain their nutritional state until consumption of menhaden



resumes in late fall. Maryland DNR tagging studies also indicate adult male striped bass natural mortality rates have risen. Dissection data collected from over 8,000 striped bass since 2006 indicates that malnutrition and starvation in Upper Bay adult male striped bass is a consequence of ecological depletion of young menhaden less than ten inches, adult bay anchovy, juvenile spot and croaker.

Year-round studies of Upper Bay resident striped bass over 18 inches determined in most years since 2006 menhaden constituted over 75 percent of their diet by weight. The Chesapeake Bay provides the principal spawning and nursery areas for striped bass. Historically the Upper Bay provided an ideal ecosystem for reproduction, survival and growth for high numbers of healthy striped bass.

This natural productivity has deteriorated due to severe declines and fluctuations in populations of forage fish, primarily Atlantic menhaden, bay anchovy, river herring and spot. Upper Bay striped bass exceeding 18 inches in length consume few prey fish during summer months when water temperatures exceed 70 degrees Fahrenheit and consequently experience a significant loss of weight.

However, immature females don't use accumulated fall winter fat reserves for egg development or undergo the stress of spawning. Therefore, these young females experience less mortality from malnutrition and disease than adult males of similar age. During early summer of 2006 to 2009 the average ratio of adult male to immature female striped bass, 18 to 28 inches long, was approximately 17 to 1 in the Upper Bay. That is a little bit higher roughly what the historical average is thought to be.

In the late spring of 2010 30 percent of the adult male striped bass had no visceral fat, the highest percentage during the study, which was followed in the fall by the largest decline in sex ratios of adult males to immature females. From late spring to early summer of 2010 through 2012, the adult male to immature female sex ratio average decreased to approximately three to one, providing evidence that a disproportionate number of adult male striped bass are experiencing an increased rate of natural mortality that threatens the striped bass fishery in the Chesapeake Bay.

If you look on the back of the summary that I passed out, you'll see charts that I think are fairly explanatory. The top chart shows you the decline in the percentage of adult males in the Bay and the ratios are also given in the square in the bar chart.

Then at the bottom you can see the average percentage of striped bass with no visceral fat; how over the last three years those fish, the percentage has gone up and the fish are showing the signs of starvation. Then when you look at the other chart you can see the ratio corresponds with this same period where it has gone down to three to one. Any questions? Thank you.

CHAIRMAN O'CONNELL: Thank you, Mr. Price. The information was provided to the Striped Bass Technical Committee at their meeting last week. Any other members from the public? All right, moving forward, Agenda Item 4 is Draft Addendum III. Kate is going to provide us with a brief overview and then a summary of public comments.

### DRAFT ADDENDUM III

#### REVIEW OF DRAFT ADDENDUM III

MS. KATE TAYLOR: I'll be providing a brief overview of the addendum that was included with your briefing material and then review the public comment that was received. As you may recall through the previous board briefings, the Interstate Watershed Task Force investigation within the Chesapeake Bay resulted in over \$1.6 million levied against 19 individuals and 3 corporations for than one million pounds of illegally harvested striped bass worth up to \$7 million.

These investigations revealed that the control measures in place for regulating harvest were ineffective or inadequately designed to maximize compliance. Additionally, greater accountability of wholesalers would be difficult to achieve without uniform tags and tagging requirements, valid year and size limits inscribed on the tags, and increased dealer compliance education.

In response, the board initiated Draft Addendum III with the objective that illegal harvest of striped bass has the potential to undermine the sustainability of striped bass populations on the Atlantic Coast as well as reduce the economic opportunities of commercial fishermen who are legally participating in the fishery.

Pages 9 through 20 of the draft addendum contain information on the states that currently have a commercial striped bass fishery and information on their program implementation. Getting into the management measures of the documents, the main item for board consideration is the commercial tagging program implementation.

Option 1 would be the status quo and Option 2 would be a mandatory tagging program. Under this option, states would be required to implement a tagging program when striped bass are commercially harvested within the state or jurisdictional waters. This is the LEC recommendation. If the board goes forward with Option 2, there are a number of other categories that the board will have to address.

The first one is the tag information and type. Option 1 would be for a state program where states would be required to submit annually to ASMFC commercial tag color, style and inscriptions for all years. Option 2 would be for a uniform tagging program, and this is the LEC recommendation with some modification.

That modification is that the LEC recognizes the desirability of continuing to use more than one color tag to identify fish caught in certain gears or areas. Nonetheless, the LEC recommends a uniform tagging program should be developed by the board which incorporates the requirement spelled out in Option 1 while allowing some flexibility to states in their use of more than one tag color per year.

The overall goal, however, should be to use a standard color or colors each year among all of the states. Category B deals with tag timing. The first option is the no action alternative. The second option is for a point of harvest tagging. This would refer to either after removing the fish from the gear, prior to attending another piece of gear, moving beyond a specified distance from the gear or before removing the fish from the boat.

The board can make the determination on how they would like that specified, and exceptions are permitted for safety concerns. Under this point of harvest option, there is Suboption 1, which this would be implemented coastwide for all states or jurisdictions with a commercial fishery. Suboption 2 would be for any programs that are only initiated after the approval of this addendum, and that's the LEC recommendation.

Option 3 is for point of sale tagging, otherwise known as dealer tagging. Again, Suboption 1 would be coastwide for states with a commercial fishery, and Suboption 2 would be for any programs initiated through this addendum. Category C deals with tag allowance. Option 1 is the no action alternative. Option 2 would be for a biological tag allowance, and this is the LEC recommendation.

Category D deals with tag accounting. Option 1 again is the no action alternative. Option 2 is for tag

accountability and this is the LEC recommendation. This would require any commercial tagging program must require permit holders issued tags to turn tags in or provide an accounting report for any unused tags prior to the start of the next fishing season.

Category E deals with tag reporting. Option 1 is the no action alternative. Option 2 would require ACCSP standards, which would be a minimum of monthly reporting, and this is the LEC recommendation. There is a table in this option which highlights the current requirements that are currently in place.

Category F deals with exportation. Option 1 is the no action alternative. Option 2 is the LEC recommendation, which would require that under a mandatory commercial tagging program it would be unlawful to purchase striped bass without a commercial tag. This is to prevent the sale of striped bass into a state or jurisdiction where there is currently no commercial fishery.

Category G deals with processing. Option 1 is the no action alternative. Option 21 is the LEC recommendation where tags must remain affixed until processed for consumption by the consumer. There may be some issues that the board has to consider when large striped bass are filleted into multiple fillets and sent to different markets. The draft addendum also contains some recommended penalties. Mainly it is recommended that states and jurisdictions strengthen their penalties for striped bass violations so the penalties are sufficient to deter illegal harvest of striped bass. The implementation schedule will depend on the measures that may be approved by the board and the ability for states to respond. Many states already have contracts in place for purchasing 2013 commercial tags. Thank you, Mr. Chairman.

CHAIRMAN O'CONNELL: Before we get to the public comments, does the board have any questions? Yes, Rob.

MR. ROB O'REILLY: Just a minor correction; on Page 26 under C, tag allowance, Virginia is used as an example, and it is not quite the way it is written that the tags are based on the previous year's average catch. What it really is it's an individual-based weight quota, and so it is the average weight that goes along with any particular fisherman's catch from the previous year. It is based on weight, which conforms with the recommendation.

CHAIRMAN O'CONNELL: Thanks, Rob. Seeing no other questions, Kate, can you provide the board a summary of the public comment?

#### SUMMARY OF THE PUBLIC COMMENT

MS. TAYLOR: Every state with a commercial fishery held a public hearing with the exception of the Potomac River Fisheries Commission. In total, 44 people attended the seven public hearings. I would just note that 26 of those 44 were in attendance at the Maryland hearing. There was no public attendance at three hearings. Those were in Rhode Island, Delaware and North Carolina.

In regards to tagging program implementation, all comments received at the public hearings were in favor of a mandatory commercial tagging program. Comments received varied on the different categories. With regard to tag information, the majority of the people at public hearing supported a state program.

In regards to tag timing, the majority of the people at public hearing supported point of harvest tagging. There were many concerns that were expressed for the safety of the fishermen. Under tag allowance, all comments received on this issue were in favor of Option 1, the no action alternative. Those were all received at the Maryland public hearing.

Under the tag accounting, reporting, processing and exportation categories, all comments received on these issues were in favor of Option 2. Additional comments that were received included fishermen should be tagging the fish before they come off the boat and immediately when removed due to safety concerns.

Tagging requirements could depend on the type of gear. If fishermen start paying for their tags, the number of active fishermen could decline. There was concern for fishermen not having access to tags when they have fish. It was brought up there is reduced discarding in ITQ fisheries and ASMFC needs to adjust the discarding rate used in the quota allocation.

The public comment period did run from May 22<sup>nd</sup> to July 3<sup>rd</sup>. In total 24 individuals submitted comments. Three organizations also submitted comments; the New Jersey Coast Anglers Association, the Atlantic Surf Casters Club, and the New York Coalition for Recreational Fishing. There were two organizations that had form letters coming into ASMFC. One was from Strippers Forever and the other was an unknown organization.

All of the comments received were in favor of a mandatory commercial tagging program. Under the category of tag information, the majority of written comments or e-mail comments received were in favor of a uniform tagging program. Under tag timing, all the comments received were in favor of point of harvest tagging, and there was one comment in favor of the coast-wide requirements.

All comments received either by e-mail or in mail that addressed Category C through G were in favor of Option 2, and there was support expressed for increased penalties. Additional comments that were received included legal practices and overharvest are far more commonplace than we would like to believe but are difficult to prove with limited resources; that the actions or inactions taken by one state affects all of the others; that even significantly larger fines too often are regarded as only the cost of doing business to some fishermen; the striped bass numbers in the North Atlantic Coastline are declining drastically; to stop all commercial fishing and also that the recreational fishery needs to be addressed. Thank you, Mr. Chairman.

CHAIRMAN O'CONNELL: Thank you, Kate. Before we get into the discussion, I failed to mention that we are fortunate today to have Mr. Hittenbach, Mr. Ingerson, Mr. Bailey and Mr. Endress, who have put in a lot of time in regards to this law enforcement issue and are to answer to any questions that you may have that they would be more appropriate to respond to. They are a resource here for you guys.

#### CONSIDERATION OF FINAL APPROVAL OF ADDENDUM III

CHAIRMAN O'CONNELL: We're going to move into consideration of final approval of Addendum III. I think Kate provided a good overview of the items that we need to discuss. We can have some general discussion or kind of move into what I think the first question that needs to be answered is 3.1, whether or not the board wants to move forward with a mandatory tagging program. If so, then there are six other issues that the board needs to have some discussion on and then lastly with the penalties. Mr. Augustine.

MR. PATRICK AUGUSTINE: **Mr. Chairman, would you entertain a motion that the board approves 3.1, Option 2?**

CHAIRMAN O'CONNELL: Yes, I would entertain that motion at this time.

MR. AUGUSTINE: I make that motion, Mr. Chairman.

CHAIRMAN O'CONNELL: Tom Fote, is that a second? All right, we have a motion move to approve Option 2 for Section 3.1, Commercial Tag and Program Implementation; made by Mr. Augustine; seconded by Mr. Fote. Discussion on the motion? Mr. Augustine.

MR. AUGUSTINE: To the point, Mr. Chairman, I thank the Law Enforcement Committee. They did an outstanding job in presenting what their recommendations were to capture the harvest and sale of striped bass up and down the coast. Their efforts have produced very admirable results in terms of encapsulating a lot of this illegal activity that is going on. There is still a lot of illegal activity going on, and I think this will further reduce that. Once we can accept this coastwide, we move forward with it and I think we'll all hit a homerun.

CHAIRMAN O'CONNELL: Thanks, Pat. Any other comments? Seeing none, does the board need to caucus on the motion? All right, we will call the question. All those in favor please raise your right hand. **The motion carries unanimously.** A.C., you have a question?

MR. A.C. CARPENTER: Whenever you're ready for a motion.

CHAIRMAN O'CONNELL: Go ahead, A.C.

MR. CARPENTER: **A motion to approve Option 1 under Item A as written.**

CHAIRMAN O'CONNELL: We've got a motion to approve Option 1 under Category A. Motion made by Mr. Carpenter; second by Rick Bellavance. All right, discussion on the motion. Under this option states would still have the flexibility to use multi-colored tags, which is an issue that has been brought to the attention. I know in the discussion with law enforcement, they do see the tradeoffs to having standardized colored and multi-colored, but this option would standardize some of the information that would be on the tag. Mr. Clark.

MR. JOHN CLARK: Mr. Chairman, I was just curious was the modified recommendation from the Law Enforcement Committee be that there is uniform colors based on the fishery so that each state would have the same color tag depending on the fishery or were they just for a uniform color for everything?

CHAIRMAN O'CONNELL: Do one of you guys want to respond to that? Kate has got it.

MS. TAYLOR: The LEC recommendation was for modifications that would require the specification that is under Option 1 that the tag must be tamper-evident; the tags are required to be valid for only a one-year season; tags are required to be inscribed with year of issue, the state of issue and a unique number; and then where possible tags should also be inscribed with the size limit, the permit holder's identification number; but then also it would require that the board develop the colors that would be used in any given year, so there would be standardization in the colors.

MR. CLARK: It could be more than one color?

MS. TAYLOR: There could be more than one color. Yes, that is specified in the document and could be however many colors the board chooses.

MR. WILLIAM A. ADLER: Point of order or something; the motion that Pat Augustine made had a discussion and then there was a move to call the question. There was a vote. Was the vote to call the question or move the actual –

CHAIRMAN O'CONNELL: My understanding the vote was on the motion that was made by Mr. Augustine. Was that not clear to anybody?

MR. ADLER: Well, it wasn't clear to me because at the last board meeting we had a vote every time somebody called the question.

CHAIRMAN O'CONNELL: I will try to clarify that better in the future, Bill. Mr. Fote.

MR. FOTE: That is only if somebody requests a vote on calling the question. You don't have to do that if nobody requests a vote.

CHAIRMAN O'CONNELL: All right, any other discussion on this motion? Mr. Geiger.

DR. JAIME GEIGER: Mr. Chairman, I guess I would ask some clarification on what are some of the constraints against Option 2, uniform tagging program? Is it an issue of funding; is it an issue for – I'm still unsure what is the resistance to Option 2 as expressed by one or more of the folks around this table.

CHAIRMAN O'CONNELL: Others may want to chime but what I have heard leading up to this meeting is while there are some benefits to a uniform

color tag in interstate commerce, there are also some benefits in-state for having multi-colored tags by gear type or by seasons. Are there other board members that want to also respond to Mr. Geiger? Mr. Carpenter.

MR. CARPENTER: I made the motion because I think we've got the longest standing tagging system along the east coast. It's well established and we think we know what we're doing pretty well. I think the other concern with the uniform tag is you now begin to consider a cost as well as do you have to buy them through ASMFC or do we have a supplier?

If it ain't broke, it doesn't need fixing, and I don't think this needs to be – the basic tagging issue is they all need to be tagged. As far as law enforcement goes, if you have the minimum requirement information on the tag, regardless of what color it is, law enforcement can do their job.

DR. MICHELLE DUVAL: Mr. Chairman, my understanding is that Option 1 doesn't preclude the board or states coming together to decide that perhaps for the ocean fishery, which is a major commercial fishery. I understand that both Maryland and Virginia and PRFC use different colors for different gear types.

This does not preclude the board from coming to some agreement to say, well, we want to use a blue tag for this upcoming year for most of the ocean-related fisheries; does it? I would assume that we would still have the option to do something like that in the future. North Carolina is slightly different in that we use – the three different colors of tags that we use are representative of different areas.

We have one for the ocean fishery; one for our Albemarle Sound fishery; and then one for our central southern fishery, which is outside of ASMFC, which is different than other states that are using different tag colors. It still seems to me that if the board chose to want to use one single tag color for the majority of the ocean fisheries, this would not prevent us from doing so down the road. That's all I wanted to clarify.

CHAIRMAN O'CONNELL: All right, Kate is saying that is possible. It is kind of up to the board to decide. Roy.

MR. ROY MILLER: Mr. Chairman, I just wanted to clarify to the LEC the difference between Option 1 and Option 2 in this Category A is just color, uniform color. That's the only difference. Otherwise, all the

provisions that are listed under Option 1 would have applied to Option 2 as well. It is just that the color would be uniform. That is the only difference that we're talking about is color?

CHAIRMAN O'CONNELL: I think that is the principal difference; and just to point out that Option 1, the size limit and the permit holder's identification is not a requirement, but it would be to add to the tag if possible. Whether or not that would have been a requirement with a uniform standard tagging program for the coast under Option 2, I don't know, but the color is the principal difference, Roy. Tom.

MR. FOTE: I think if you just put a friendly amendment in there saying that if states want to regionalize; say like Massachusetts and Rhode Island want to use the same color tag, they can do that. That is always an option in the plan. I don't see where we have to make them come back to the board, so just as a friendly amendment one of those options is if states want to regionalize their color of tag in their certain area for the year and implement that, that would be up to them.

MR. CARPENTER: Tom, I don't think you need have a friendly amendment. I think if you read it, each state has got to submit a plan. As long as the board approves the three states using blue, it is a done deal. I don't think that is necessary.

MR. FOTE: All I was trying to do is address Michelle's question and I thought that would be just the easiest.

MR. AUGUSTINE: Mr. Chairman, another point. Back to that point of Option A, so are we assuming now that the states that are going to keep their same tagging system will have the better part of the information on their tags? In other words, what the law enforcement people are looking for was minimum size; state of issue, which they have now which have the unique number linked back to the permit holder and so on.

So, what will your tags not have that law enforcement is requiring? I know in New York they're just given a permit number and that is good for a particular year. It doesn't give the other information that the law enforcement people were looking for. I think they were looking for clarity so it had the size limit, actual legal size limit for the animal in that particular state. I think that is what you were looking for; wasn't it.

I think if we can hear from the law enforcement group, that might be a little helpful. Again, it may not be possible to do that with the existing state's tag that you have; but if this is going to help them, I'm wondering if you can add that information to your tags without a tremendous additional cost. It would be helpful particularly for the interstate commerce portion of that. If we hear from law enforcement, I would appreciate it.

CHAIRMAN O'CONNELL: And just before do, just to make sure everyone is on the same page, Option 1, information that would be required on the tag would be the state of issue, a unique number that could be linked to the permit holder and the year; and where possible the size limit and the permit holder's identification number; and if law enforcement would want to provide the board some feedback on those that are discretionary. Wayne.

MR. WAYNE HITTENBACH: I'll field that for them for them. Otherwise, I would have Lloyd do it, but Lloyd has go bronchitis and not able to speak so much today. I know you all know him better than you know me. The goal here with our recommendation, just to keep in mind what we're trying to achieve, the idea of getting to as few colors as possible up and down the coast is important for accountability in the marketplace for once the fish leave the boat and they're traveling in interstate commerce.

It is virtually impossible to hold wholesalers accountable when there is a literal rainbow of colors that show up in their cold storage or in their freezer in the same year. If you can get that number of colors down from all the states to say it is three colors this year – it's red, white and blue – and if you see a fish that doesn't have a red, white or blue tag, it is an illegal fish this year.

Something with that kind of clarity of message makes it easy to educate wholesalers. Again, I recognize there is a tradeoff here between ease of enforceability on the water versus ease increasing compliance; but I think if you can – the recommendation was meant to provide enough flexibility to allow by having a mandatory color system, so at least it would be the same colors in each state each year however the state wants to use them.

If they want to do it for ocean versus inland, fine. If they want to do it by different gear types for PRFC, then they have to consolidate some to get down to three or four colors – whatever that number is, that is the purpose of the color. To address some of the

concerns I heard, it wouldn't be a matter of – I don't think any of the law enforcement recommended proposals says that the board is going to decide where every state has to buy their tags from. That is not what it says.

It just says you have to do the color and you have to have this information. There isn't some sort of top/down force going to require all of the states to buy from the same person and do the same purchasing. That is not what the proposals say. And then as far as cost, we've done some research on cost.

For example, in the PRFC, according to their reports, they issued something like 107,000 tags last year. I personally spoke to two manufacturers in the last two weeks and they said that at tag runs of more than a couple thousand, the extra cost for printing up to two lines of 14 characters per text, they don't charge any extra for that.

When you're dealing with the volume of tags that are being issued – and I have two companies that I talked to and this is back of the envelope numbers, and the prices were down to something like eighteen cents per tag. In our discussions today, I know Lloyd, they print various things on the tag and they're at about fourteen cents a tag in Maryland.

The notion that putting this information on is an extreme cost; yes, there may be a slight cost, but it is minimal. If you break that cost down, for example, in the PRFC – well, the two distributors that I talked to said no difference in cost at that volume of tag for a – if you're printing something like PRFC on or Maryland, to then add other lines; no difference in cost.

The key thing here is to try to get it down to as few colors as possible, give the states as much flexibility as they have, and then to – the size limitation is important to let wholesalers – if you're someone buying this fish and it comes in with a tag that says you've got a slot limit of 18 to 36 and it is a 54-inch fish, there is at least fighting chance then that wholesaler is going to say, whoa, I'm not taking this, and so we get compliance in the marketplace even if law enforcement isn't there.

And if a wholesaler does take it, you have the ability to say you're holding a fish that has a tag on it that says 18 to 36-inch maximum, and you're sitting there holding a 54-inch fish, that gives a chance at enforcement. And this is not a hypothetical exercise. In our investigation there were fish coming out of Maryland but more particularly out of Virginia and

the PRFC going to wholesalers where the fish were 50 and 60 inches in size at a time period when there was a slot size of 18 to 36 inches at that particular time.

The wholesaler's defense was I can't keep track of all the different size limits from all the different states and all the different times, and I can't keep track of these tags with so many colors. And there is something to that; and so by going with the recommendation that we've adopted, that is why we did it. I don't think the cost is there. Reducing the number of colors to as few as possible is going to help enforcement. We felt the proposal struck a balance and that is why we went with that recommended proposal.

MR. AUGUSTINE: I appreciate that explanation, and that is why I was concerned that if states were going to keep the same tags and same colors they have, would it be possible for them to make sure that they included that point, the minimum size or size range of slots. Until we get to that point in time, we minimize the total number of colors we have, that may be the next step.

It seemed to me that current iteration calls for including that range size, minimum, maximum, by that state, and I think that would help the whole system tremendously. I guess I would ask the question of the board is it possible for you to talk to your folks that make your tags to include that information and are there states that would have a problem doing that. Would it require you, Mr. Chairman, to accept a motion that we require that as part of Option 2, that we would expect states to include on their tagging program. I'll leave it up to you, Mr. Chairman, which way you want to go.

CHAIRMAN O'CONNELL: Yes, I think Option 1 at this point in time, it's an option for the state to consider doing but not a requirement. From Maryland's perspective, we're interested in adding the size limit given the recommendation from the Law Enforcement Committee, but it would be optional at this point in time the way the motion is written. Tom.

MR. FOTE: The questions I want to ask; after listening to law enforcement, I think we could have three colors in a state, but all the states have the same three colors. That would make it an easy way of enforcement. I have done tags for a couple of my fishing clubs, and we know cost comes in modifying lines. When you're doing that volume, it usually doesn't cost.

That is what I wanted to make sure I asked A.C. about. I think if we could add those two things, require this information to be on a tag, it should be on the tag. If it is coming from a state where it is part of the slot limit at that time, at least it becomes enforceable. Without that, it is not enforceable. The three colors, as law enforcement just said, makes it easy to interpret; and if he would accept that as a friendly amendment, I could support that.

I've been vacillating here on whether I could support this motion or not; but with those two recommendations that we can have three colors – I always like you decide what colors – I'll give you an example. I print newsletters; and we do a purple one month, orange month, and we have them scheduled on what we do. We could do that three years out with tags. This year we're going to have purple, green and lavender or all the crazy colors.

Next year in 2015 we'll have those three colors and all the states will have those three colors for as many fisheries they have. The other question I'll ask A.C. through the Chair is do you need more than three tags; if we need more than three tags, then we make it four colors, but do you give out more than three tags right now or four tags?

MR. CARPENTER: We currently use four different colors; red, white, blue and black. That's the only four colors we're using. We change the year on the label right now every year, and the manufacturer has not charged to change that yearly date on it. Our problem is that the manufacturer that we're using – and this is the tag that we use. It's Tyden Brooks.

It is the best tag that we have found and for those states that are using the little button tags, let me tell you that we had a big discussion about that several years ago, and a little piece of sandpaper makes that a reusable tag very, very easily. These tags are not reusable. They are restricted to three lines of text in the manufacturing process right now.

I have been on the phone with them for the last two days. I have four lines of text. If you want to add season and size limit, it gives me four lines of text, they cannot do it. We don't have a problem with adding it when and if we can get the technology that will do it, but this company will not do it.

The reason that we have four lines of text is that we close the season during the spawning months. To give you an example, the pound net fishery, their season opens February 15<sup>th</sup> and closed March 25<sup>th</sup> with an 18-inch minimum size limit and a 36-inch

maximum size limit. Their season reopens June 1<sup>st</sup>, after the spawning season is over, until December 15<sup>th</sup> with an 18-inch minimum size limit.

If I add the PRFC or the state in the line with the gear type or without the gear type, but if I add the PRFC on it, that is the third line; and if I add a serial number, that's the fourth line. The manufacturer can't give me what I want. I don't have a problem with adding it, but I can give you season or I can give you size limit on the third line, but I can't give you two split seasons with two different size limits on the tag that we're using that is tamper evident and is a very good product.

We have tested virtually all of the tags that I see being used; and for our money, this is the best product there. If they've got a better product, if you talked to another company that has a better product that can provide four lines of text at the spacing that you need to get the dates and the size limit coordinated, please give it to me because we can't find anybody that can do it.

MR. O'REILLY: With Option 1 with the state program, I think what is favorable about that is the declaration to ASMFC in terms of the tag report. I think that is very important. I would think that Virginia does not have quite the complications that the Potomac River Fisheries Commission has, but we have employed two different colored tags; one for the coastal area and one for the bay area since 2003.

Each tag has the year, the authority of the issuance which is VMRC, the area of the fishery. It also has the minimum size limit and all tags are sequentially numbered for the harvesters that have part of the limited entry individual weight quota. I'm not sure we could do something easily about a slot limit that is very brief, lasts from March 26<sup>th</sup> through June 15<sup>th</sup>, which is also a time within the bay – that's only within Chesapeake Bay where the amount of harvest is relatively small compared to other times of year, like spring and fall.

I'm not sure having that 18 to 28-inch limit on a tag would alleviate the situations about having a 54-inch fish show up in a different marketplace as much as ASMFC being able to disseminate all the information for all the states, to all the law enforcement authorities would. I underscore that this is a major step to have that information centralized through ASMFC. I'm not sure you can solve all the all the law enforcement problems just the tag itself.

I do think the idea of having standardized bay and coastal tags brings up problems within the Chesapeake Bay, and Virginia does keep discrete colors because of that reason because you do have overlapping jurisdictions. I can appreciate the idea that perhaps it would be good to be uniform in some sense, but on the other sense with this declaration to ASMFC and the law enforcement agencies knowing about the tags, as they haven't before, that has got to be a big step forward.

One other thing, if I may. It is quite an effort to distribute, collect, parcel out tags in a limited entry program. Each year our agency spends I would say two weeks minimum with probably ten staff people collecting all the tags, parsing them out, sequential numbers for all the harvesters, going to four different sites, one including the agency where these tags are distributed to fishermen where the previous year's tags are mandatory to be collected at that time or there are no tags offered for that year; that's a lot of time and effort right there. That's really the main reason why I couldn't see the idea of putting an 18 to 28 option for another round of doing all that for a minimal amount of tags and a minimal amount of harvest during that March 26<sup>th</sup> through June 15<sup>th</sup> period. It is a practicality aspect as well.

CHAIRMAN O'CONNELL: Thanks, Rob. That was everybody on my list. I think we have had a good discussion of this motion. I think the board has heard the tradeoffs of standard colors or multi-colors. We've heard the tradeoffs on size limits. Option 1 does provide the states the opportunity to either individually or work collectively to reduce the number of colors, to add size limits where appropriate. I think we're wrapping up this discussion; so unless somebody has a burning additional point to make, we will call the question. Do you guys need a caucus?

(Whereupon, a caucus was held.)

CHAIRMAN O'CONNELL: All right, we're going to call the question. All those in favor please raise your right hand. **The motion passed unanimously.** Kate has reminded me that the board is going to have to determine a date for which a report will be submitted that describes a state's tagging program. I suggest we kind of do that at the end when we get to the implementation schedules. Under B was tag timing, and there are three options; the no action, the point of harvest and the point of sale which is at the dealer. Discussion on that item under the commercial tagging program? Ritchie.



MR. G. RITCHIE WHITE: **Motion to approve Option 2.**

CHAIRMAN O'CONNELL: So this would be a motion under Section B, Option 2. Ritchie, we need clarification on it would be Suboption A or Suboption B. Suboption A is for approved coastwide; Suboption B is to approve for new commercial tagging programs. Okay, so it should be Suboption A under Option 2. **We have a motion to approve Option 2, Suboption A for Category B** made by Mr. White; second by Pat Augustine. Discussion on the motion? Paul.

MR. PAUL DIODATI: Yes, this particular option would be very troubling for the Commonwealth of Massachusetts. I think we're the only state that doesn't conduct a tagging program today. Our fishery is also an open fishery. It is not limited entry. We have thousands of participants in our fishery.

This option goes above and beyond what is really desired, and that is to improve enforcement. This would actually forcibly change the way the Commonwealth has to manage its fishery. It will force us into a limited entry fishery. It will force us into perhaps some type of individual quota to issue the tags efficiently to its harvesters.

I appreciate that some states already do that and I don't suggest that they stop doing that. If they want to continue to do that, they should, but I don't think a tagging program should go this far that it changes the way a jurisdiction is currently managing its fishery and the way it chooses to manage its fishery. As long as we stay within our quota, I think that should be our option to manage the fishery the way we see fit. I can't support this motion.

CHAIRMAN O'CONNELL: Thanks, Paul, and I think this is something that the board needs to have some discussion on. Michelle Duval.

DR. DUVAL: Mr. Chairman, I'll echo some of Paul's remarks and just note that Suboption B was actually the LEC recommendation I believe under this option. We don't have a limited entry fishery. It is something that our commission has considered, and at this point they're not willing to take any action on that due to the inflexibility that is in the statute right now that allows them to potentially pursue a limited entry fishery.

We have something like 5,500 licensed fishermen. Although anyone who participates in the fishery is required to get a permit, anybody can get a permit.

That permit is not restricted and so it is unpredictable with regard to the total number of participants we'll have in our fishery each year. I recognize the concerns that have been voiced with regard to the potential for poaching activities at point of harvest versus point of sale.

One thing that I would say is that enforcement of tagging at point of harvest really isn't any different than enforcement of a trip limit. We have trip limits for all of our fisheries. The Albemarle/Roanoke fishery is actually a bycatch fishery. I think also the concerns from our law enforcement staff are that this is a system that our fishermen are not used to.

We have a dealer-based reporting system. The tags are distributed to the dealers. The dealers are required to report daily with regard to the number of tags that they've used, the total number of pounds. We've already discussed amongst staff requiring – you know, we issue a numbered sequence of tags to the different dealers and we will be asking them to report on the sequence numbers of tags that they're going to be using.

The concern is that if we were to try to make a wholesale move towards a completely different system, that the fishermen are going to lose the tags, and that creates actually more opportunities for poaching that our law enforcement staff are very concerned about. I with Mr. Diodati on this and I'm going to have to vote against this motion.

MR. ROBERT BALLOU: Mr. Chairman, Rhode Island joins with North Carolina and Massachusetts in opposing this motion for many of the same reasons Dr. Duval just pointed out. We have a very strong program right now, dealer based, and this would cause us to have to go back and start from scratch with a whole new program that we do not think would work as effectively. We have a good rapport with our dealers and very good reporting and accountability right now, and we would hope the board would see fit to honor the strong program that we currently have rather than having us switch to something new. Thank you.

CHAIRMAN O'CONNELL: I think one thing that may be helpful for the board to look at is there are several other elements of this addendum that may reduce some of the risks with delaying the point of tag into a dealer level. The board has already agreed to implement a mandatory tagging program, so that kind of removes the option for someone to harvest the fish and work its way up to Massachusetts which didn't have a tagging program.

That hopefully will be eliminated based upon the actions we've already taken. Biological metrics, which we haven't discussed yet, if that was added to the program, that is going to reduce the number of tags that are available and the whole fleet reduce the amount of overharvest potential. Some of these aren't just independent options. We need to look at them collectively and try to figure out what makes sense. Pat.

MR. AUGUSTINE: To the point that North Carolina, Massachusetts and I believe Rhode Island raised about the tagging programs; the question I would have for the law enforcement folks, what kind of reaction or difficulty are the law enforcement folks having in each of those three states without trying to point fingers at them for being bad guys for not having a tagging program or having a program that is not trackable?

I'm concerned that if we were to go forward and allow a dispensation, if you will, for North Carolina with their program, Massachusetts and otherwise for their program; what kind of a negative impact would it have on the LEC? I'm not sure you can address each one individually or collectively.

From what you've stated in previous meetings, you have indicated that we need to have commonality; and that although if we implemented a tagging program – and it may be difficult for some states – my concern is how do we cut down on the illegality, and is there a problem – and, Paul, I'm not picking on your folks in Massachusetts because you have a system that works for you. I'm concerned that the LEC sees it from their perspective and not allowing a lot of legal but illegal fish on the market. So, gentlemen, if you'd respond to that, I'd appreciate it.

MR. LLOYD INGERSON: I'll give it my best shot. I can't speak for investigations in any of those states specifically, but what I can tell you is the further a fish travels without a tag in its mouth the more potential for abuse there is. The more jurisdictions we have that do not have commonality with time of tagging the more opportunities or more holes in the system there is to be exploited. For those states that do not currently have the point of harvest systems, I understand the issue with changing their fishery, but when the investigation falls in your state you may have a different point of view.

MR. O'REILLY: I just had a question for Paul. I heard Michelle say that at the dealer level that they have sequential tags; is that also the case for the

Massachusetts dealers? In other words, is that way that is done there?

MR. DIODATI: No, we're the only state that does not have – we do not have a mandatory tagging program.

CHAIRMAN O'CONNELL: Mr. Bailey wanted to provide a comment before we go to John.

MR. JACK BAILEY: Just one thing about the tagging – and we have worked on this for quite a few years – when we're chasing a load of fish, if it doesn't have tags on it and let's say it crosses into your state in Massachusetts and then it turns around and comes back to our state, which has happened, there is no way that we have to enforce because they don't have tags. A lot of times they're oversized fish that leave. I know what you're doing up there doesn't only affect you. It affects our fish, too, and our big fish, the fish we're trying to protect.

MR. CLARK: I just want to say in Delaware we're a small state with a small fishery, but we do enforce tagging at the point of capture. The netters don't like it, but we speak from experience I does work. It really has helped cut down on our illegal catch. Thanks.

MR. DIODATI: I would like to make a motion to substitute. I would like to substitute the current motion with the approval of Option 3, point of sale, dealer tagging with no suboption.

CHAIRMAN O'CONNELL: Kate is telling me that you have to choose Suboption A, coastwide, or Suboption B for new programs.

MR. DIODATI: I prefer not to because Suboption A would force every state that has harvesters tagging their fish to switch to their dealers tagging their fish; would it not? I don't support that. I think that if a state is currently requiring its harvesters to tag fish because they manage the program in such a way that that is efficient; I support that.

Likewise, Suboption B would still require Massachusetts, since it's a new program coming on line through this addendum, to do something that it doesn't want to. I'm not sure why we have to approve one of the suboptions. By approving just the Option 3, the state would have the option of either point of sale or point of harvest as long as they're tagged in the state before it leaves the state or as soon as it is sold.

CHAIRMAN O'CONNELL: Yes, I think Option 3 would require all states to do point of sale, so we're trying to clarify what jurisdiction does it apply to, and it sound like –

MR. DIODATI: I don't view it that way. I would view it as if you required your harvester to tag, then that would be more restrictive because the tags would already be on the fish when they get to the dealer, when they get to the point of sale, and so you're actually accomplishing it.

MS. TAYLOR: The way the document reads right now Option 3 would require that tagging occurs by the dealer at the time of first sale.

CHAIRMAN O'CONNELL: So, Paul, I think you're trying to get like a combination of a few different options and we're just trying to spell it out a little better than just referring to Option 3, which is very specific to requiring the dealer. Bob.

ACTING EXECUTIVE DIRECTOR ROBERT E. BEAL: Paul, it looks like you're actually talking about Category B, Option 1, which is no action. Under this option a state or jurisdiction may choose to implement their commercial tagging program either at the point of harvest or the point of sale.

MR. DIODATI: Too bad I didn't see that sooner. **Could I modify my motion to substitute to Option 1, Part B.**

CHAIRMAN O'CONNELL: Okay, we have move to substitute to approve Option 1 for Category B. Motion made by Paul Diodati; seconded by Rick Bellavance. Discussion on the motion? Pat.

MR. AUGUSTINE: It is unusual that the board and all the states are literally being asked to bend the rules for one state, one of our sister states, Massachusetts, when in fact we only have two other states that use point of sale. All the rest of us are using the tagging program that seems to be effectively working.

In this particular case, I think it is somewhat unfair that we should be looking at an option that not does not fit the bulk of the states but actually changes the direction we're trying to go, and in my humble opinion will allow continued sale of fish that fall outside of a tagging program that heretofore in other states is working.

I would either move to table this motion forever and go back to the drawing board or ask the maker of the

motion to consider maybe instead of implementing this whole program with January 2013, or whatever the date is, for the states that would have to require a change, such as possibly North Carolina and/or Rhode Island and/or Massachusetts, that maybe they could have a little longer period of time to implement, and maybe theirs would be a carryover to 2014.

But to abdicate the direction that we're going and the LEC is trying to help us go in terms of controlling this illegal sale of striped bass, it just seems to be we're moving away from where we should be heading as far as the commission is going. If we want to capture this, similarly we're going to have to do it with blackfish sooner later. This may be the tip of the iceberg.

To go away from the direction that we have been heading and that generally all the states are complying with a tagging program of some way, to change the program for only one party who will have some difficulty, no question about it, in selling the program to their fishermen, I just think it is asking a bit much of the board to go along with this motion. I don't know how we could support it. Thank you, Mr. Chairman.

MR. CARPENTER: I would like to speak in favor of the substitute motion. I think that for the states that do use a dealer-based tagging system, it has been effective. I think when we get to Section G of this document, it says that it shall be unlawful to sell or purchase any striped bass without a commercial tag. Whether it is tagged in the boat or it is tagged when it arrives at the dock and gets counted then, it will be tagged before it enters interstate commerce from any one of the three states that need to. I speak in favor of this motion.

MR. DAVID SIMPSON: I really just wanted to be clear that I understood the change that has already occurred. By adopting a tagging program, Option 2, this does represent a change for Massachusetts and other states where they will have to have at least at the dealer a tagging program and states that want to do the point of harvest continue to do that. This does add to the sort of security of the law enforcement; is that right?

CHAIRMAN O'CONNELL: That's correct; a tagging program would be required going forward. I think all the states are hearing very loudly from the law enforcement that you want to try to get the tag on as quickly as possible, but the substitute motion

would provide more discretion for the state going forward. Michelle.

DR. DUVAL: I guess I haven't heard any remarks that the North Carolina system is not effective. I'll refer again to the remarks that were made earlier with regard to enforcement. If you have a point of harvest tagging system, that needs to be enforced. You need to make sure that those fish have tags on them just the way our enforcement officers have to ensure that a harvester doesn't have more than the total allowable number of fish in their boat.

I don't see what the difference is. This would require significant and not readily available resources to change what we're doing now. We are the only state that requires daily reporting of our dealers for all tags and all fish that are sold. I don't believe any of the other states with tagging programs currently require that level of reporting. We are compliant with ACCSP standards with regard to the reporting that we do require. I am going to vote in favor of the substitute motion.

CHAIRMAN O'CONNELL: I think it has been a very good discussion on the issue. I'll give you guys a few seconds to caucus on the substitute motion. The motion is move to substitute to approve Option 1 for Category B. Motion made by Mr. Diodati; seconded by Mr. Bellavance.

(Whereupon, a caucus was held.)

CHAIRMAN O'CONNELL: All right, all those in favor please raise your right hand; all those opposed please raise your right hand; null votes; any abstentions. **The motion passes 8, 7, 1 abstention. That becomes our main motion.** For the record, we moved to approve Option 1 for Category B. All those in favor please raise your right hand; all those opposed please raise your right hand; any null votes; any abstentions. **We had 8, 6 to 1, so either way it would have passed, so the motion carries.** The next item, Category C, is tag allowance. There are two options. One is no action and Option 2 is to base the tag allowance on some biological metrics. A.C.

MR. CARPENTER: **I move to approve Option 2 under Category C.**

CHAIRMAN O'CONNELL: Move to approve Option 2 under Category C. Motion made by Mr. Carpenter; seconded by Mr. Augustine. Discussion on the motion? Seeing none, we'll give you guys a few seconds to caucus.

(Whereupon, a caucus was held.)

MR. BALLOU: Mr. Chairman, before the vote, just because I'm struggling to make sure I understand exactly how this would apply; could I ask the maker of the motion to just amplify a bit on how this would work and how states would implement this provision.

MR. CARPENTER: The way that we do it is we look at the history of, for example, the gill net fishery over the past three years, calculate an average size of harvest during that period, and then we allocate the number of tags for the following gill net season based on what we expect the harvest would be and what our allowable quota is.

CHAIRMAN O'CONNELL: Bob, I think you raised a good point because Option B is very specific to using biological metrics to distribute tags to the permit holders, but some states have a state quota, I think like yours, and under the Law Enforcement Committee recommendation it was also saying you could use biological metrics to develop the number of tags to support your state quota. Kate is saying that under Option 2 that flexibility would be there for the states.

DR. DUVAL: And that is what North Carolina does. We use the average weight of a legal-sized fish to estimate the number of tags that we're going to need for each of our fisheries.

CHAIRMAN O'CONNELL: All right, are you ready to vote? All those in favor please raise your right hand; all those opposed please raise your right hand; any null votes; any abstentions, 1 abstention. **The motion carries.** Okay, Category D is tag accounting. There are two options. One is no action and the second is implementing a tag accountability program. Mr. Augustine.

MR. AUGUSTINE: **Mr. Chairman, move that we accept under D, tag accounting, Option 2, tag accountability as described.**

CHAIRMAN O'CONNELL: Move to approve Option 2 under Category D. Motion made by Mr. Augustine; second by Mr. Miller. Discussion on the motion? Seeing none, we'll give you guys a few seconds.

(Whereupon, a caucus was held.)

CHAIRMAN O'CONNELL: All right, all those in favor please raise our right hand; all those opposed

please raise your right hand; any null votes; abstentions. **The motion carries.**

MR. ADLER: Just a question on that; to other states that have that, where they have to turn the tags in, how does that work and does it work? I mean, you're expecting fishermen, if they don't use the tag, to turn it into the state; is that how that works? I don't know if that is a program they've got now, how does it work?

MR. CARPENTER: Bill, our system, since we have limited entry fisheries for the striped bass fisheries, the tags are issued based on – how many tags they get is based on the gear type and on the metrics of what the average size is and what our quota is. They are issued to them prior to the season. At the end of the season – or during the season they have weekly reporting that they must submit, and it shows how many tags they used each week.

At the end of the season, they bring their old tags back that have not been used. Let's say that we had issued them 500 tags and they bring back or they report 450 fish, they owe us 50 tags. We have had cases where they will – you give them 500 and they end up catching 510 fish. In our case if the numbers don't match at the end of the season, there is a one-for-one tag penalty imposed the following year.

If you were issued 500 tags, you used 450 and you can't return any tags to us, next year you're going to get 450 tags. If you sent in your reports that you used 510 tags and you don't have any and you come back, you're going to get 490 next year because you couldn't have caught more fish than you accounted for. That is how we track it.

MR. ADLER: Okay, do you have a closed system as opposed to 4,000 licenses?

MR. CARPENTER: Well, we've got 400 and a staff of three, so it is all proportional. I will tell you from personal experience when you open the bag up and you take 10 or 20 or 30 tags out and throw it in the trash; it gets their attention that they need to pay attention to what they're doing.

CHAIRMAN O'CONNELL: Okay, we're on **Category E**, reporting. Pat.

MR. AUGUSTINE: **On reporting, I would recommend Option 2.**

CHAIRMAN O'CONNELL: We've got a motion for Option 2 under Category E, reporting; so move to

adopt Option 2 under Category E, reporting, made by Mr. Augustine; second by Mr. O'Reilly. Discussion on the motion? Rob.

MR. O'REILLY: I just wanted to add a little bit to reporting in general. Since everyone is aware now that the tags are year-specific, one of the reporting elements is that if you get tags back, then you can audit that fisherman's harvest as well to make sure that when he declared a certain amount of tags, that you're reconciling whatever he turns or she turns in.

CHAIRMAN O'CONNELL: Any other comments or discussion on the motion? All right, all those in favor please raise your right hand. **The motion carries unanimously.** Our next category is Category F, striped bass processing. We have a no action, Option 1; and Option 2 is to require the tags to go along with the fillets. Mr. Augustine.

MR. AUGUSTINE: **Mr. Chairman, I would under F, striped bass processing, we approve Option 2.**

CHAIRMAN O'CONNELL: Okay, we have a motion to move to approve Option 2 under Category F by Mr. Augustine; seconded by Allen. Discussion on the motion? Michelle.

DR. DUVAL: I guess I'll just note some of the LEC remarks in which considering when fillets are removed from larger fish and don't go to the same market; our dealers are required to keep the tags with the fish and retail or wholesale market – you know, I don't know if the restaurant owner purchases fillets at a retail place for preparation and sale at the restaurant and they're not buying the whole fish, I have a little bit of concern about that. I definitely support Option 2. I'm just a little bit concerned about that and would just note that the LEC drew our attention to that as well.

CHAIRMAN O'CONNELL: Anybody on the LEC want to provide some comment to that?

MR. HITTEBACH: This is one we actually had a fair amount of discussion with in light of the public comment. The question being, okay, obviously, you fillet a fish, you have two fillets, you've got one tag; what do you do in that circumstance? We kicked around several approaches on how you would handle that and we didn't come up with one that we think would – the amount of work that would be required to deal with that problem probably wasn't justified by what we view the problem to be.

If a restaurant is buying fillets, they're typically buying boxes. Mostly we see it is sold in boxes by the pound. It is a 20-pound box or a 30-pound box or however it is sold. When you're talking about the volume of sale that is going to someplace like a restaurant, if you're selling a 20-pound box, at the end of the day you're may end up with one fillet short or one fillet there or not. I would think you would be able to balance that out and make it work.

On the occasions that you didn't, it would be such a small percentage of the fillets, it would be one fillet per 30 pounds or 50 pounds or whatever you're buying the quantity in. If you're buying in larger quantity and it is boxed, you're ultimately going to end up with maybe one fillet there that is not going to have that.

When that happens, it seems like that would be such a de minimis amount that it would not be able to have the tag with the fillet; and it would be so infrequent that to try to right now look at that and remedy that would seem to be not really worth the effort to do that. We recognized it could happen.

There are some states that are requiring it I think already; and this was an issue – we talked to them – that they had confronted and they didn't come up with a good solution, and they're still requiring the tags to follow the fillets, and there has not been an issue yet. While I think it is a theoretical problem, when you think about it, I think it is unlikely to occur very often; and if it does, in any great quantity. That was really the best answer we could come up with for that.

MR. CARPENTER: Has anybody checked with health department regulations or health department concerns about having the used tags accompanying the shipment of a consumable product? Right now we tag the whole fish; and then after it is processed, that tag – I don't know if many of you have seen one, but it really is not all that pretty by the time that they finish with it. Is there some kind of health department concern before it gets to the restaurant that needs to be addressed in this? I'm asking the question; I don't know.

CHAIRMAN O'CONNELL: I'm not sure, A.C. Several states are doing it already, including Maryland, and we haven't had any issues from Maryland's standpoint. I don't know if any of the other states can provide some response to A.C. Dave.

MR. SIMPSON: I guess I'm just wondering about the practicality and the assumption that a whole fish is going to end up with the consumer, especially when you talk about some of the higher minimum size states. Once it goes to the dealer, presumably fish go to a fish processor. I mean, it can go to a fillet house type of thing and the restaurant wants a certain portion, and they probably want that done. I know two weeks ago I had striped bass and it was in the form of a sandwich and it was the tail of the fillet. I picture that restaurant bought tails of fillets because they don't want a fillet that is two and a half inches thick. They want a very thin fillet, so I don't see how any of this tagging is workable past the dealer/processor. I don't know how you can hold this right down to me; you know, there has to be a tag goes with that sandwich I had. It starts to get to trying a little too hard here.

MR. KYLE SCHICK: As a restaurant owner and also I do have a small quota of rockfish, the concept really isn't that you have a tag for each fillet. That is a little – but the restaurants usually buy the whole fish filleted or several fish. It is not like flounder that comes in frozen in 20-pound boxes. Usually it varies; and even if it doesn't, what was talked about before, the odd fillet isn't really the issue.

You want to be able to go into a restaurant and see that they have tags. Even if the restaurant fillets the fish themselves, they take the tag off and they keep the tag. There is no way to account a fresh pile of fillets over here to associate with a bunch of tags that are sitting with them. I think the concept really is that you just have to have tags, and they have to be able to relate to the fish that you have in general; at least this year's.

I've gone into places where it's here are my tags, and it's like, well, those are last year's tags, so this fish is probably not very tasty. Also, if we're starting to talk about even having the tag numbers written down on the ticket that you buy it; we've even had the federal government come in and will look for my box tags for my chicken. I didn't even know that chicken had tag numbers on the box. These types of things; you're not looking to do each tag for each fish as much as you are just making sure that they good enough tags for the amount of fish that they have in their refrigerator in fillets.

CHAIRMAN O'CONNELL: Thanks, Kyle. Any other comments on the motion? All right, I'll give you guys a few seconds to caucus.

(Whereupon, a caucus was held.)

CHAIRMAN O'CONNELL: All right, are you ready to vote? All those in favor please raise your right hand; all those opposed please raise your right hand; any null votes; any abstentions. **The motion carries.** The last category under the tagging program is Category G, striped bass exportation; two options. Mr. Augustine.

MR. AUGUSTINE: **Mr. Chairman, I move under G, striped bass exportation, Option 2.**

CHAIRMAN O'CONNELL: I've got move to accept Option 2 under Category G by Mr. Augustine; second by Mr. Allen. Discussion on the motion? Let's go ahead and vote, then. All those in favor please raise your right hand; all those opposed; any null votes; abstentions. **The motion carries unanimously.**

**The last item in the addendum is Section 3.2, penalties.** In talking to Kate, penalties can't be a compliance requirement so this is more of a recommendation to the states to consider increased penalties, including revocation and suspensions. I'm looking for board action to include this as a recommendation to the states in the addendum.

MR. AUGUSTINE: **Mr. Chairman, move to include it.**

CHAIRMAN O'CONNELL: Okay, I've got a motion by Mr. Augustine to **include Section 3.2, penalty recommendations to the states; seconded by Mr. Lustig.** Discussion on the motion? All those in favor please raise your right hand. **The motion carries unanimously.** Now we are into Section 4, which is compliance.

We need to insert dates for requiring the states to submit their programs to implement Addendum III and then an implementation date for Addendum III. As Kate previously mentioned, and we need to hear from the states, but I think some states already have moved forward with ordering their tags for 2013 or are going to be very shortly.

There may be some obstacles to do that in time for January 2013, whether that is possible or not, or if we have to look at doing a January 1, 2014 implementation date. Let's begin there and then we can backtrack to when states have to submit their programs. Is January 1, 2013, an option or are we looking at January 1, 2014? Mr. Augustine.

MR. AUGUSTINE: Mr. Chairman, I guess the question would be to the individual states; do they

feel that they have time to go through the ordering process so we can move forward. If the majority of the states can do so, I would suggest we go for an implementation date of January 2013. Could we have a show of hands, Mr. Chairman, to see if that would help us make that decision? Otherwise, we'll go to 2014. I prefer 2013, but I think it is based on the states and their ability to order tags.

CHAIRMAN O'CONNELL: What states would have difficulty in implementing the components of Addendum III by January 1? Massachusetts, I would assume. Michelle, do you have a comment?

DR. DUVAL: Just a comment; North Carolina's fishing year starts December 1<sup>st</sup> for our ocean striped bass, so we're placing orders like next week. I need to know ASAP what is going to happen. It could be a push; I have to go back and talk to staff and see if we could get that order in time. Also for our ASMA fishery, we have a spring season and a fall season. The spring season officially starts January 1<sup>st</sup>.

CHAIRMAN O'CONNELL: And if we go with January 1, 2013, states are going to have to put their plans together pretty quickly to be reviewed in order for the states to go forward.

MR. CARPENTER: I think the ASMFC has got to approve the plans before we order the tags, which is even earlier than – we have already ordered our tags for 2013. We put the order in two weeks ago for our gill net fishery, which starts in November. We've already got that in the works, I think based on what we have adopted here today, I think we've got all the criteria that we need and I think we can all comply with it pretty quickly except for the states that don't have it. I think we may have to extend states that don't currently have tagging programs an extra year to get on board or something.

CHAIRMAN O'CONNELL: Kate is going clarify the plan requirement.

MS. TAYLOR: Just for clarification, states would have to submit a plan detailing their tagging program for the upcoming fishing year, but there is no requirement for review or approval by the board; just to inform ASMFC of what their tag colors will be for the coming year.

MR. DIODATI: It is not so much ordering and acquiring tags. We'll probably have to do a regulatory promulgation in order to implement the program. We don't have those regulations and that's how I prefer to do it.

CHAIRMAN O'CONNELL: There could be some flexibility built in for states that are implementing new programs such as Massachusetts. Mr. Augustine.

MR. AUGUSTINE: To that point, Mr. Chairman, could we go ahead and approve the addendum with the exception of allowing the states of North Carolina and Massachusetts ample time to implement by January of 2014. Before you would ask for a second, the question would be is that going to create a monster of a problem for the LEC or can they work with us in that regard in that all the other states would be implementing in January 2013?

MR. INGERSON: I believe that is something that we could work with.

MR. AUGUSTINE: Mr. Chairman, when you're ready, then, after you have further discussion.

DR. DUVAL: In terms of putting together a plan with regard to our implementation of a tagging program, it is not so much that; it's really just can we get the tag order in time with the additional information of the year and potentially the size limit on the tags in order to do it; that's all.

MR. AUGUSTINE: To that point, Mr. Chairman, I was suggesting that North Carolina and in the case of Massachusetts, they have unique circumstances that you would be allowed to develop the plan and submit it but not have to implement until January 2014. Therefore, your existing plan would continue, I would assume, and then you would have ample time to make that transition. The LEC said they could work with that, and I guess it is a question of whether it would be amenable to you folks in the state to be able to do it that way and give you 12 months to actually develop it and put it in place and convince your fishermen the value of it.

DR. DUVAL: And obviously that's fine; I was just trying to say that we're certainly able I think in terms of the tag accountability and the reporting and the issuance of tags based on a biological metric, we're doing all these things. It's really just about the information that is on the tag and being able to place that order as quickly as possible. If there was a January 1, 2013, implementation date, we would obviously strive for that but appreciate the board's latitude in trying to give us a little extra time.

MR. ADLER: I appreciate Pat's thing and I think that would be good. There is a good chance that Massachusetts can get it in probably in 2013,

probably in the summer because our seasons don't even open until the summer, anyway, so we might be able to do that, but it is good to have that little leeway because of regulatory issues.

MR. BALLOU: Mr. Chairman, we're actually in the same boat here in that we would have to make some relatively minor modifications to our regulations. I would prefer to see the language read "implementation by the start of the commercial fishing season in each state in 2013." That would work for us because of the way we pace our regulatory programs; rather than January 1; the opening of the commercial season in their respective state. Thank you.

CHAIRMAN O'CONNELL: I think the staff is trying to help us move forward. We don't have a motion yet. I think they tried to draft something. Pat, you heard from Bob and whether or not you want to make that modification, which staff seems to be doing.

MR. AUGUSTINE: Mr. Chairman, I hope the staff is able to include that and again make sure that we cover the concerns of North Carolina.

**CHAIRMAN O'CONNELL: Move to implement measures adopted in Addendum III by the opening of the commercial fishing season in each state in 2013 with the exception that Massachusetts and North Carolina must be implemented by January 1, 2014. Motion by Mr. Augustine if you're okay with that – you good, Pat, with that?**

MR. AUGUSTINE: Is that, North Carolina and Massachusetts; does that language cover you okay? Then that is the motion, Mr. Chairman.

CHAIRMAN O'CONNELL: All right, seconded by Mr. Carpenter. Discussion on the motion? Seeing none, let's vote on it. All those in favor please raise your right hand; all those opposed; null votes; abstentions, 1. **The motion carries.** The last item is a motion to approve Addendum III. Mr. Augustine.

**MR. AUGUSTINE: Mr. Chairman, I move that the board accept Addendum III, the Striped Bass Addendum.**

CHAIRMAN O'CONNELL: We've got a motion move to accept Addendum III to the ISFMP for Striped Bass. Motion by Mr. Augustine; seconded by Mr. Adler. Discussion on the motion?



MR. CARPENTER: I thought the motion that we just passed was for the implementation, which would be before the commercial season started. Don't we also need a date at which we have to submit the report prior to the season if I understood the way this was written?

CHAIRMAN O'CONNELL: Would the board be okay if we hold off on this motion until we get the date for the plans? As Kate said, we don't need a motion for that. We need a date for which the states must submit their programs to implement Addendum III. Mr. Carpenter.

MR. CARPENTER: I have a suggestion that it would be at least 60 days prior to the start of their commercial season.

CHAIRMAN O'CONNELL: Any discussion on that suggestion? I'll make it in the form of a motion if necessary.

MS. TAYLOR: Just kind of processing that suggestion; the intent of the tagging report that would be submitted would be so that we could inform law enforcement officials of all of the tagging colors that would be available or they could come into contact with in the following fishing year. If the requirement is 60 days prior to the start of the fishing season, then there could be instances where we're not getting that information until late in the year. That is just a concern.

CHAIRMAN O'CONNELL: Kate, would you have a suggestion?

MS. TAYLOR: Discussions have included either January 1<sup>st</sup> or with the compliance reports or somewhere in between there.

CHAIRMAN O'CONNELL: Previous discussion amongst staff and the plan development team has been either January 1<sup>st</sup> or with the compliance reports. Mr. Augustine.

MR. AUGUSTINE: Mr. Chairman, could you add that into that? I would make it a part of this motion. Unless there is a change in the date, I would suggest the date that the technical committee and staff talked about, January 1, 2013; concurrent with this.

CHAIRMAN O'CONNELL: I think that would be appropriate. A.C.

MR. CARPENTER: If we don't have to submit until our annual report, two-thirds of our season is over. If

law enforcement is going to need it, you're going to need it in January for us.

MS. TAYLOR: The compliance reports are due June 15<sup>th</sup> and so you would have to include the information for the next fishing season with the compliance reports. It's not for the current fishing season. That was originally suggested but recognizing that most states probably don't have their contracts in place or might not know what colors they're going to do for the following season when they submit their compliance reports.

MR. CARPENTER: I would suggest that we use January 1<sup>st</sup> of each year to submit the current year's season – all right, make it December 31<sup>st</sup> for the following year you have to submit it.

CHAIRMAN O'CONNELL: Anybody object to using December 31<sup>st</sup>? Bob.

MR. BALLOU: Mr. Chairman, I think I'm following this correctly. The way our season works in Rhode Island, we open in June and each year we go through the process of setting the commercial specifications, the regulatory program beginning in January and culminating in March or April. I'm concerned that we're going to be out of sync here. We would prefer to submit our report on what our program is upon adoption, which would be probably in March/April timeframe for 2013.

MR. CARPENTER: And that timeframe for us, our season is essentially – the bulk of our season is over. I don't know when you want these. That is the reason I had suggested 60 days before the season starts because the North Carolina starts –

DR. DUVAL: December 1<sup>st</sup>.

MR. CARPENTER: – the first of December. Virginia has got a year-round season.

CHAIRMAN O'CONNELL: It seems to be kind of focusing now on 60 days before the commercial season starts for each jurisdiction. I'm seeing a lot of heads shaking. Any objection for requiring the state plans to be submitted 60 days before the jurisdiction start of the commercial season – the state's first commercial season for that fishing year. Everybody good with going forward with that? All right, now we will go back to the motion on the table; move to accept Addendum III to the ISFMP for Striped Bass. Motion by Mr. Augustine and seconded by Mr. Adler. Bob.

MR. BALLOU: Mr. Chairman, just a point of clarification; because the board voted to allow states to choose between tagging programs at either the point of harvest or point of sale, will the final language in the addendum reflect that? Right now there is a reference to permit holders. I think you may have already had that sidebar with Kate, but I just want to make sure that it doesn't specify permit holders, because that wouldn't apply if you're at the dealer level.

CHAIRMAN O'CONNELL: Yes, we will make that clarification. Good point, Bob, thanks. Any other comments on the motion? All those in favor please raise your right hand. **The motion carries unanimously.** We've got two other agenda items that I don't think will take as much time. Agenda Item 5 is Virginia's request for alternative management. Okay, Kate, is going to provide an **overview** and then we're going to have a **technical report** on it.

### **VIRGINIA'S REQUEST FOR ALTERNATIVE MANAGEMENT**

MS. TAYLOR: Virginia has requested two modifications to their commercial fishing season. The first is to open the Virginia commercial striped bass fishery on January 16<sup>th</sup>. The current starting date is February 1<sup>st</sup>. Virginia has stated that area closure provisions of the Amended Large Whale Take Reduction Plan and the Harbor Porpoise Take Reduction Plan have greatly reduced the fishing time and has created unsafe fishing conditions.

DR. ALEXEI SHAROV: The technical committee reviewed Virginia's request on this issue; and with respect to this part, the technical committee noted that the total catch is limited by the ITQ and thus cannot exceed the established limits. The extension of the fishing period is small and is likely to provide opportunity for some harvest but will not result in significant increase in fishing mortality. Therefore, the technical committee recommended to approve this request.

MS. TAYLOR: There was a second modification Virginia requested, which was to allow pound nets in the Chesapeake area from May 1<sup>st</sup> to June 15<sup>th</sup> to harvest up to 50 striped over 28 inches.

DR. SHAROV: There was a more significant discussion of that second part of the request. The technical committee noted that this regulatory change will create significant differences in conservation policies between Chesapeake Bay jurisdictions. For

example, striped bass harvest in pounds nets in Maryland is allowed only beginning June 1<sup>st</sup> and all fish larger than 36 inches must be released.

The technical committee expressed concern that additional harvest of migrating striped bass can be undesirable at this point considering that the spawning stock biomass of the stock is declining is based on the most recent stock assessment update and the projections indicating that we could be at the overfished status by 2017. The technical committee recommends delaying the decision on the second proposal until the benchmark assessment is completed and the results become available so that you could make a more informed decision based on the updated status of the stock.

CHAIRMAN O'CONNELL: Thanks, Kate and Alexei. We've got two requests; one that the technical committee is supportive of and one that we're looking for more information. Go ahead.

MR. CLARK: I just had a few questions. Is that 50 striped bass over that whole season or 50 striped bass per day?

DR. SHAROV: Per trip.

MR. CLARK: Per trip, okay, and would that count against the quota?

DR. SHAROV: Yes.

MR. CLARK: Okay, it counts against the quota; and what is the usual mortality rate of striped bass in the pound net fishery by discard mortality?

DR. SHAROV: We're currently using the 5 percent mortality estimate, but it is certainly temperature dependent, but that is an approximate estimate.

MR. CLARK: So as the temperature rises in that period of time, they'd be more likely to be found dead in the pound net?

DR. SHAROV: That is theoretically the case, but there are no thorough studies that would actually support this, so at the moment the estimate that we have is essentially an expert estimate.

MR. O'REILLY: I would just add a little bit. Concerning the first item and the request for a season that starts on January 16<sup>th</sup>, Kate outlined the situations with the gill net fishery and the large mesh closures that have occurred. Mainly since these harvesters – there is about 31 in the coast and a

number in the very lower part of the bay, the quota underages over the last two years have been 22 percent for the coastal area and 10 percent for the bay area and probably more this year, so it is a situation of a very controlled quota system, ITQ on a weight basis for each harvester, so that was the nature of the request.

The second item, we certainly can see what the stock assessment does, but just to give a better idea to John's question, all the fisheries in the bay in May and June account for somewhere between 1.5 and 1.9 percent, depending on the last two years, of the total harvest. I think earlier I mentioned that from March 26<sup>th</sup> through June 15<sup>th</sup> is a lowest harvest time, and certainly May and June are very low. What Virginia will do will be to bring this up again.

We have looked at additional data that we can supply the technical committee the next time not only for pound nets – and there are about 11 that are involved here, 11 pound nets – but also on their daily catch. We will work towards that the next time. It is very important to see what the next stock assessment shows and to take a look at the spawning stock overall, and we agree to the technical committee's findings on that.

MR. AUGUSTINE: Alexei, when you noted it would have a direct impact on the spawning stock, my concern was that there was a statement in here that said that it would alleviate some of the safety problems that these fishermen might encounter later in the year. My concern is that these fish are pre-spawned.

If you're going to go back at 50 a day per person, I think it's minimum size over 28 inches, what kind of impact would that have, that two-week period of time from January 15<sup>th</sup> to the February date have on the stock. Is that what you're referring to having a negative impact on the stock overall?

DR. SHAROV: I'm not sure if you're not confusing the first proposal with the second, but –

MR. AUGUSTINE: I may.

DR. SHAROV: Yes, all right, but with respect to the first one, the technical committee felt that there is an ITQ-based quota for each fisherman; and as long as the quota is established appropriately, then therefore they're entitled to harvest their quota. We were provided information that they were not able to do so because of the conservation-related closures related to other species. Therefore, the committee felt that

the earlier start of the season by two weeks is warranted.

MR. JAMES GILMORE: Would you like a motion, Mr. Chairman.

CHAIRMAN O'CONNELL: Yes.

MR. GILMORE: **Move to extend the beginning of the Virginia commercial striped bass season from February 1<sup>st</sup> to January 16<sup>th</sup>.**

CHAIRMAN O'CONNELL: We have a second by North Carolina; Bill Cole. We've got move to extend the beginning of the Virginia commercial striped bass season from February 1<sup>st</sup> to January 16<sup>th</sup>. Motion by Mr. Gilmore; seconded by Bill Cole. Discussion on the motion? Seeing none, all those in favor please raise your right hand; all those opposed; any null votes, 1 null vote; any abstentions. **The motion carries.**

All right, it sounded like, unless the board wants to take further action in regards to Virginia's other recommendation, some more information will be brought forth for the technical committee. All right, the last agenda item is a possible addition to our stock assessment membership. Russ.

MR. RUSS ALLEN: **Mr. Chairman, in response to a request from the technical committee and the stock assessment subcommittee, New Jersey would like to nominate Mike Celestino to the Striped Bass Stock Assessment Subcommittee.**

CHAIRMAN O'CONNELL: Second by Mr. Augustine. Any discussion on the motion? Any objection for moving that forward? **The motion carries.**

## ADJOURNMENT

Any other business to come before the board? Without any objection, meeting adjourned.

(Whereupon, the meeting was adjourned at 4:15 o'clock p.m., August 7, 2012.)

**DRAFT Striped bass Stock Assessment Terms of Reference\***  
**for SAW/SARC-57**  
(file vers.: 10/3/12)

**B. Striped bass**

1. Investigate all fisheries independent and dependent data sets, including indices of abundance and tagging data. Discuss strengths and weaknesses of the data sources.
2. Estimate commercial and recreational landings and discards. Characterize the uncertainty in the data and spatial distribution of the fisheries.
3. Use the statistical catch-at-age model to estimate annual fishing mortality, recruitment, total abundance and stock biomass (total and spawning stock) for the time series and estimate their uncertainty. Provide retrospective analysis of the model results and historical retrospective. Provide estimates of exploitation by stock component, where possible, and for total stock complex.
4. Use the Instantaneous Rates Tag Return Model Incorporating Catch-Release Data (IRCR) and associated model components applied to the Atlantic striped bass tagging data to estimate F and abundance from coast wide and producer area tag programs along with the uncertainty of those estimates. Provide suggestions for further development of this model.
5. Update or redefine biological reference points (BRPs; point estimates or proxies for  $B_{MSY}$ ,  $SSB_{MSY}$ ,  $F_{MSY}$ ,  $MSY$ ). Define stock status based on BRPs.
6. Provide annual projections of catch and biomass under alternative harvest scenarios. Projections should estimate and report annual probabilities of exceeding threshold BRPs for F and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach covering a range of assumptions about the most important sources of uncertainty.
7. Review and evaluate the status of the Technical Committee research recommendations listed in the most recent SARC report. Identify new research recommendations. Recommend timing and frequency of future assessment updates and benchmark assessments.

\*These TORs were developed by the ASMFC Striped Bass Stock Assessment Subcommittee and Tagging Subcommittee, with approval from the Technical Committee



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TO: Kate Taylor, Fishery Management Plan Coordinator, ASMFC

FROM: Nicole Travisono, RI DEM, Striped Bass TC Member

DATE: September 27, 2012

SUBJECT: Striped Bass Addendum III, Commercial Tagging Report

The State of Rhode Island is requesting from the Atlantic States Marine Fisheries Commission that the date of submittal for our Striped Bass Commercial Tagging Report be changed.

As outlined in Addendum III to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan, each state with a commercial striped bass fishery is required to submit a Commercial Tagging Report to ASMFC no later than 60 days prior to the start of the first commercial fishery in that state. A requirement of this report is to include a picture and description of the striped bass tags to be issued. The first striped bass commercial fishery in the state of Rhode Island begins January 1, 2013 for floating fish traps. As a result of Addendum III, RI would have to have their 2013 commercial striped bass tags in possession no later than November 1, 2012 in order to complete the Commercial Tagging Report and be able to submit it 60 days prior to the start of the January 1<sup>st</sup> opening date for the commercial floating fish trap fishery. Due to the purchasing process in the state of RI as well as the 4-6 week manufacturing time, it will not be possible for RI to have their tags by November 1, 2012 and be compliant with Addendum III. Historically, even though the fishery starts January 1, our floating fish trap fishery does not land striped bass prior to March 1<sup>st</sup>. Therefore we are requesting that we be allowed to submit our Commercial Tagging Report to ASMFC on January 1, 2013. This date will allow sufficient time for the RI DEM to purchase striped bass tags for the 2013 season and complete their Commercial Tagging Report. Additionally, by submitting the report by January 1, 2013, RI will still be submitting their report 60 days prior to the start of commercial fishing activity by the floating fish traps.

**STATE OF MAINE**  
**2011 STRIPED BASS**  
**FISHERY AND MONITORING REPORT**



ASMFC Graphic

DEPARTMENT OF MARINE RESOURCES  
BUREAU OF SEA RUN FISHERIES AND HABITAT  
#172 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

June 2011

Gail Wippelhauser  
Bruce Joule

## **I. Introduction**

In accordance with Amendment #6 of the ASMFC Interstate Fisheries Management Plan (ISFMP) for Striped Bass, the Maine Department of Marine Resources (MDMR) submits the following report. The Striped Bass ISFMP requires each state to submit an annual report of its striped bass fisheries to maintain ISFMP compliance. The management unit for striped bass includes all coastal states from Maine through North Carolina, the Potomac River Fisheries Commission, Pennsylvania, and the District of Columbia. The ISFMP allows for variability in monitoring and data collection based on the significance of each jurisdiction's fishery and if the state produces striped bass in its waters.

Current management regulations in Maine prohibit commercial fishing and sales of striped bass caught in Maine waters. The possession limit of one fish restricts in-state sales of striped bass legally harvested from another states' waters. No commercial fishery monitoring program was required, or implemented in Maine, in 2011. There were no regulation changes governing the recreational take of striped bass in 2011. Maine continued to supplement the MRFSS survey to achieve recreational harvest estimates with a PSE (Proportional Standard Error) no greater than 20 percent. Maine has a small spawning population of striped bass in the Kennebec River (including the tidal sections of the Androscoggin and Sheepscot rivers). Maine closes the spawning area to fishing from December 1 through April 30. During May and June, fishing in spawning areas is restricted to catch and release with single hooked artificial lures.

States that produce striped bass are required to conduct spawning stock assessments and/or carry out surveys to establish annual juvenile abundance indices. In 1979, the Stock Enhancement Division of the MDMR began conducting a beach seine survey for juvenile shad, river herring, and striped bass in the Kennebec/Androscoggin estuary. The survey captures small numbers of young-of-the-year striped bass annually since 1987.

## **II. Request for de minimis, where applicable (NA)**

## **III. Previous Calendar Year's Fishery and Management Program**

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

#### **i. Commercial Fishery**

##### **(1) Characterization of the commercial fishery**

Current management regulations in Maine prohibit commercial fishing and sale of striped bass caught in Maine waters. Changes to state law in 2011 now prohibit the sale of any recreationally or commercially caught striped bass from waters outside the State of Maine. This change closes a loophole that existed in state law for several years, though it is unclear how many individuals sold striped bass caught recreationally caught in other states. No commercial fisheries monitoring program was required in Maine during 2011.

##### **(2) Characterization of directed commercial harvest (NA)**

## ii. Recreational Fishery

### (1) Characterization of recreational fishery (seasons, cap, gears, regulations, etc.)

Size Limit: Slot length 20-26" and 40" or greater

Daily Creel Limit: One fish, either between 20-26" or 40" or greater

Possession Limit: One fish

Disposition of Catch: No sale of Maine-caught striped bass

Gear Restrictions: Hook and line only

Open Season: No closed season statewide

Closed Season: December 1 through April 30 in spawning areas; catch and release fishing only in spawning areas May 1 through June 30.

Maine is near the northern end of the range of migratory striped bass. Because of its geographical location and relatively small striped bass population, Maine is not a key state in the recreational striped bass fishery. Striped bass fishing typically begins in late April and extends through October. The method of harvest is restricted to hook and line only. Spawning areas (Kennebec, Androscoggin, and Sheepscot Rivers) are closed from December 1 through April 30. During May and June, fishing in spawning areas is restricted to catch and release with single hooked artificial lures only.

### (2) Characterization of directed harvest

Landings and method of estimation:

In accordance with provisions of the Striped Bass Plan, states not considered key in the recreational fishery may use existing MRFSS recreational data as the estimate of recreational landings. According to the 2011 MRFSS data for Maine, the striped bass recreational harvest was 14,474 fish with a PSE of 31.2. The total weight harvested was 91,705 pounds with a PSE of 26.6 and the total number of discards (numbers released alive) was 142,505 with a PSE of 30.4. Table 1 contains estimates from previous years.

Catch composition:

Staff scientists calculate the catch composition for the 2010 recreational striped bass fishery using data collected from 66 volunteer angler logbook keepers fishing for striped bass in southwestern Maine. Table 2 contains the length frequency distribution for 1,232 striped bass caught and measured in 2011. Of the total catch, 61 fell into the 40"+ category, 58 of which were released; 693 striped bass fell into the 20-26" slot, 183 of which were kept (Table 3).

#### (i) Age frequency

Maine uses the age-length key developed by Massachusetts Division of Marine Fisheries to determine age.

#### (ii) Length frequency (legal and sub-legal catch)

See Table 3

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

Not available

#### (c) Estimation of effort (where available)



The 66 logbook keepers reported 1,105 fishing trips which, when multiplied by the number of logbook keepers and their fishing companions, resulted in 1,974 individual angler-trips. The 66 logbook keepers reported that they and their fishing companions fished more than 6,500 angler-hours over the course of the season. Anglers caught < 1.0 striped bass per angler-hour on self/family/friends trips targeting striped bass as primary or secondary target (814 trips). Of the 1,105 reported fishing trips, 91 percent (1,001) targeted striped bass as primary or secondary target.

iii. Other losses (poaching, hook & release mortality, by-catch, etc.)

Maine utilizes total catch and harvest estimates provided by the NMFS MRFSS survey. Maine fisheries staff calculates the annual hook and release mortality of striped bass by multiplying the number of released fish by the ASMFC hook and release mortality rate of 8.0%. The poaching rate (1.3%), established by the Striped Bass Technical Committee, is implemented to estimate poaching losses in the recreational fishery. Results are reported in Table 4.

iv. Total harvest & losses

Estimates of losses due to recreational harvest, hooking mortality, and poaching are located in Table 4.

## **B. Fishery Independent Monitoring Programs**

i. Results

In accordance with the Striped Bass Plan, fishery independent monitoring and tagging programs are required to generate the information necessary for adaptive management. Maine is responsible for determining an annual juvenile index for striped bass. Recruitment of striped bass in the Kennebec River estuary continues to be minimal since first documented in 1987.

Description of work performed and results:

MDMR established a beach seine survey in the Kennebec and Androscoggin estuaries in 1979 to monitor the abundance of juvenile alosines at 14 permanent sampling sites located in tidal freshwater. Four sites are on the Upper Kennebec River, three on the Androscoggin River, four on Merrymeeting Bay, one on the Cathance River, one on the Abagadasset, and one on the Eastern River. The mean tidal range at head-of-tide in Augusta is four feet; at head-of-tide in Brunswick, six feet; and in Merrymeeting Bay, eight feet. Beginning in 1987, small numbers of juvenile striped bass were captured during the survey. To better monitor the abundance of striped bass, six additional experimental sites located in the lower, salinity-stratified part of the estuary have been sampled since 1994 (Figure 1).

Each site is sampled once on a biweekly schedule from mid-July to early-October, and is typically sampled six times during the season. All samples are taken with a beach seine within three hours of low slack water. The seine is made of 3.17-mm mesh nylon, measures 20-m long and 1.8-m deep, and has a 1.8-m by 1.8-m bag at its center. One end of the seine is held stationary at the land/water interface and the other end is towed by boat perpendicular to shore; after the net is fully extended, the waterside end is towed in an upriver arc and pulled ashore. An area of approximately 300 m<sup>2</sup> is sampled. All alosines and striped bass are counted, and the total lengths of a maximum of 50 of each species are recorded. The catch per unit effort

(CPUE) index is calculated by dividing the number of individuals caught in each river segment (sites are combined) by the number of seine hauls made in each river segment.

During the 2011 field season, 20 juvenile striped bass were caught in 84 seine hauls at the 14 standard stations, resulting in a CPUE index of 0.24 fish/haul (Table 5) This was slightly below the average CPUE value for the standard stations. An additional 33 seine hauls at the six experimental stations in the lower Kennebec captured 28 juvenile striped bass for a CPUE index of 0.85 fish/haul (Table 5) This was well below the average CPUE value for the survey, but was the highest catch for the past five years at these stations. Based on DMR's experience and comments made by striped bass guides, adult striped bass were scarce again in the Kennebec River during 2011.

#### **IV. Planned Management Programs for the Current Calendar Year**

##### **A. Summarize regulations that will be in effect**

The regulations for the current year remain the same as last year and are described in Section III.

##### **B. Summarize monitoring programs**

Maine will continue to supplement the MRFSS survey to achieve recreational harvest estimates with PSE (Proportional Standard Error) no greater than 20%. Maine will continue the beach seine survey for juvenile striped bass in the Kennebec River.

##### **C. Highlight any changes from the previous year**

There are no plans for any changes from the previous year.

Table 1. Maine recreational striped bass landings from MRFSS Recreational Survey.

Year	Number Harvested (A+B1)	A+B1 PSE	Weight (lbs) Harvested	Weight PSE	Discards	Discard PSE
1982	929	76.5	2,663	77.1	687	94.4
1983	7,212	44.9	13,031	46.4	0	0.0
1984					1,887	100.0
1985	11,862	51.8	140,951	63.0	81,153	42.4
1986					4,379	82.9
1987					18,106	48.7
1988					4,528	65.2
1989	738	96.0	15,221	93.6	16,028	49.6
1990	2,912	80.0	60,483	80.8	12,542	63.8
1991	3,265	76.6	58,177	95.3	67,490	41.9
1992	6,357	48.2	107,693	58.8	31,177	25.9
1993	612	100.0	11,953	100.0	373,064	35.0
1994	3,771	41.4	66,451	41.9	363,703	27.5
1995	2,189	41.6	45,933	42.7	505,758	22.3
1996	1,893	42.0	44,802	42.6	1,626,705	19.2
1997	35,259	21.9	185,178	24.3	1,417,976	19.4
1998	38,094	17.0	178,584	20.3	691,378	17.7
1999	21,102	20.1	98,623	19.9	649,816	20.1
2000	62,186	14.3	269,325	14.7	942,593	15.2
2001	59,947	12.2	290,233	12.3	870,522	12.6
2002	71,907	11.4	383,270	13.1	1,392,200	10.2
2003	57,765	16.2	253,910	16.6	846,708	15.0
2004	36,091	17.0	168,099	17.8	740,082	15.0
2005	65,205	16.0	301,334	17.1	2,870,208	15.8
2006	73,540	18.1	393,431	19.4	4,026,635	13.8
2007	72,827	18.0	316,331	18.7	1,105,347	18.7
2008	49,172	14.5	238,452	17.2	470,237	21.6
2009	52,997	15.4	288,741	15.6	247,157	15.1
2010	18,749	19.2	109,531	19.1	191,442	16.7
2011	18,105	26.7	91,705	26.6	142,505	30.4

Table 2. Length frequency distribution of measured striped bass reported by 66 Volunteer Logbook Anglers for the 2011 Maine recreational striped bass fishery.

<u>Length **</u> <u>(inches)</u>	<u>Number</u>	<u>% of Total</u>	<u>Cumulative Number</u>	<u>Cumulative %</u>
8	0	0.00%	0	0.00%
10	0	0.00%	0	0.00%
11	0	0.00%	0	0.00%
12	0	0.00%	0	0.00%
13	0	0.00%	0	0.00%
14	1	0.08%	1	0.08%
15	6	0.49%	7	0.57%
16	7	0.57%	14	1.14%
17	11	0.89%	25	2.03%
18	26	2.11%	51	4.14%
19	36	2.92%	87	7.06%
20	30	2.44%	117	9.50%
21	37	3.00%	154	12.50%
22	57	4.63%	211	17.13%
23	36	2.92%	247	20.05%
24	80	6.49%	327	26.54%
25	67	5.44%	394	31.98%
26	109	8.85%	503	40.83%
27	82	6.66%	585	47.48%
28	123	9.98%	708	57.47%
29	107	8.69%	815	66.15%
30	111	9.01%	926	75.16%
31	104	8.44%	1030	83.60%
32	44	3.57%	1074	87.18%
33	38	3.08%	1112	90.26%
34	23	1.87%	1135	92.13%
35	17	1.38%	1152	93.51%
36	17	1.38%	1169	94.89%
37	8	0.65%	1177	95.54%
38	14	1.14%	1191	96.67%
39	3	0.24%	1194	96.92%
40	8	0.65%	1202	97.56%
41	11	0.89%	1213	98.46%
42	8	0.65%	1221	99.11%
43	2	0.16%	1223	99.27%
44	2	0.16%	1225	99.43%
45	4	0.32%	1229	99.76%
46	1	0.08%	1230	99.84%
47	2	0.16%	1232	100.00%
48	0	0.00%	1232	100.00%
49	0	0.00%	1232	100.00%
50	0	0.00%	1232	100.00%
<b>Totals:</b>	<b>1232</b>	<b>100.00%</b>	<b>1232</b>	<b>100.00%</b>

Table 3. Number of striped bass released versus number retained based on striped bass total lengths reported by 66 Volunteer Logbook Anglers during the 2011 Maine recreational striped bass fishery.

**Measured Lengths Only  
2011 Volunteer Angler Survey Logbook Data\***

<b>Length (in.)</b>	<b>No. Released</b>	<b>% Released</b>	<b>No. Kept</b>	<b>% Kept</b>	<b>No. Total</b>
<b>20</b>	69	12.1%	0	0.0%	69
<b>21</b>	46	8.1%	10	5.4%	56
<b>22</b>	86	15.1%	13	7.0%	99
<b>23</b>	29	5.1%	16	8.6%	45
<b>24</b>	99	17.4%	37	19.9%	136
<b>25</b>	51	9.0%	50	26.9%	101
<b>26</b>	130	22.9%	57	30.6%	187
<b>40</b>	15	2.6%	2	1.1%	17
<b>41</b>	12	2.1%	0	0.0%	12
<b>42</b>	13	2.3%	0	0.0%	13
<b>43</b>	5	0.9%	0	0.0%	5
<b>44</b>	6	1.1%	0	0.0%	6
<b>45</b>	4	0.7%	1	0.5%	5
<b>46</b>	1	0.2%	0.0%	0.0%	1
<b>47</b>	2	0.4%	0.0%	0.0%	2
<b>48</b>	0	0.0%	0.0%	0.0%	0
<b>49</b>	0	0.0%	0.0%	0.0%	0
<b>50</b>	0	0.0%	0.0%	0.0%	0
<b>Totals:</b>	<b>568</b>	<b>100.00%</b>	<b>186</b>	<b>100.00%</b>	<b>754</b>

Table 4. Maine Striped Bass Harvest and Losses, 2011

<b>STRIPED BASS HARVEST AND LOSSES IN MAINE FOR 2011</b>			
<b>COMMERCIAL DIRECTED FISHERY:</b>	<b>NO COMMERCIAL FISHERY</b>		
<b>COMMERCIAL BYCATCH (GILL NETS):</b>	<b>UNKNOWN BUT CONSIDERED INSIGNIFICANT</b>		
<b>Recreational:</b>	Number	Pounds	Mean weight/fish
Total Recreational Catch	160,610		
Total Recreational Harvest	18,105	91,705	5.1
Catch and Release Mortality(.08)	11,233	56,899	5.1
Poaching (.013)	2,088	10,576	5.1
	0.013		
Total Losses	31,426	159,180	

Table 5. Striped bass young-of-year survey and CPUE index, Maine.

Year	Standard Stations			Experimental Stations			Overall
	Number of Hauls	Total Catch	CPUE Index	Number of Hauls	Total Catch	CPUE Index	CPUE Index
1987	74	26	0.35				
1988	68	3	0.04				
1989	68	1	0.01				
1990	68	4	0.06				
1991	63	16	0.25				
1992	80	1	0.01				
1993	71	1	0.01				
1994	69	23	0.33	36	245	6.81	2.55
1995	83	2	0.02	36	3	0.08	0.04
1996	69	4	0.06	30	8	0.27	0.12
1997	80	9	0.11	36	0	0.00	0.08
1998	82	14	0.17	33	0	0.00	0.12
1999	80	13	0.16	34	17	0.50	0.26
2000	84	6	0.07	36	10	0.28	0.13
2001	96	17	0.18	42	3	0.07	0.14
2002	110	11	0.10	42	117	2.79	0.94
2003	84	20	0.24	36	104	2.89	1.03
2004	75	10	0.13	36	36	1.00	0.41
2005	82	66	0.80	36	146	4.06	1.80
2006	83	225	2.71	36	960	26.67	9.96
2007	84	3	0.04	35	0	0.00	0.03
2008	69	22	0.32	34	24	0.71	0.45
2009	81	10	0.12	30	0	0.00	0.09
2010	84	0	0.00	30	0	0.00	0.00
2011	84	20	0.24	33	28	0.85	0.41

Figure 1. Juvenile alosine and striped bass survey sites in the Kennebec and Androscoggin estuaries. Stations SB9 through SB14 are experimental stations; others are standard stations.

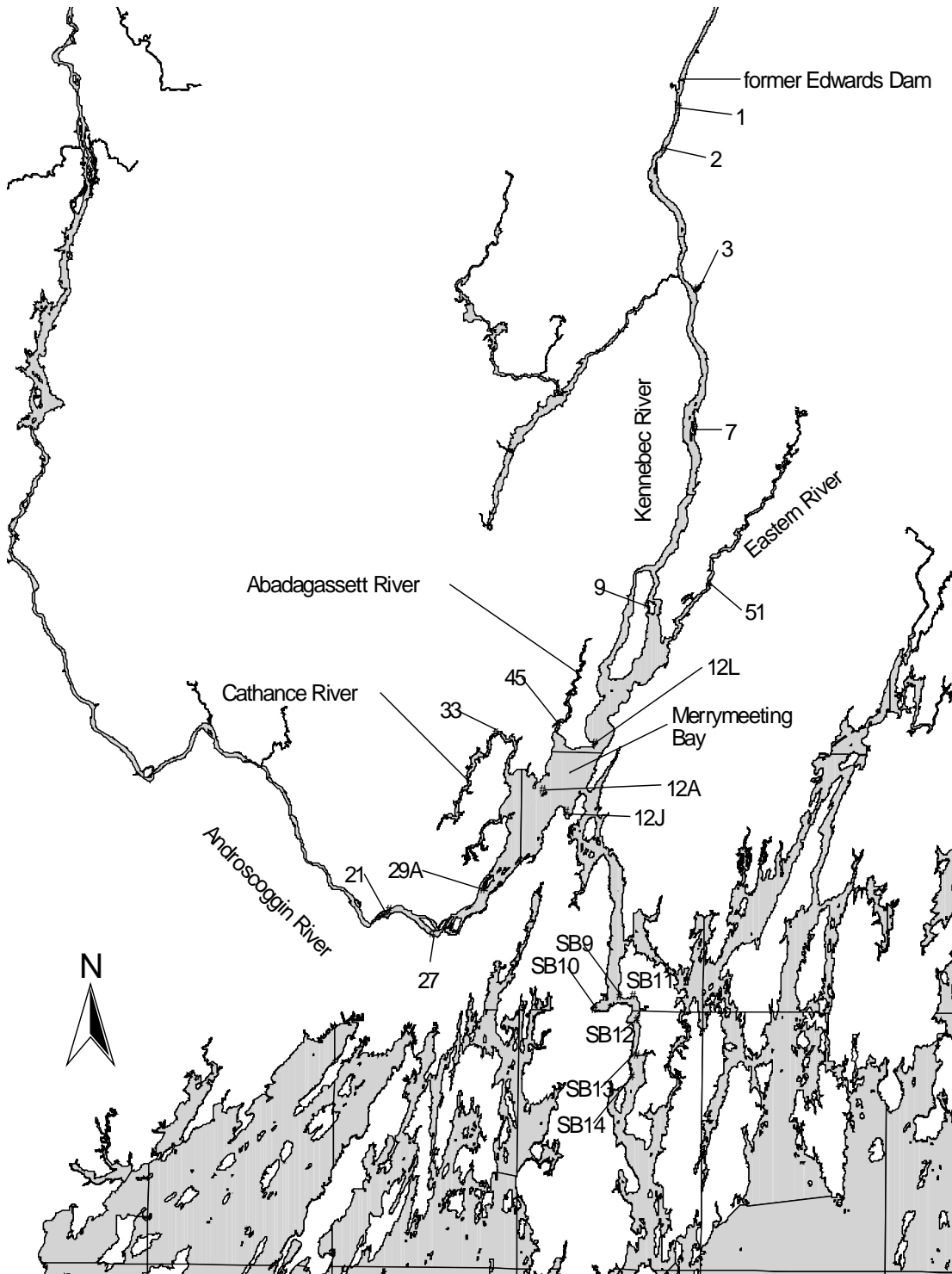
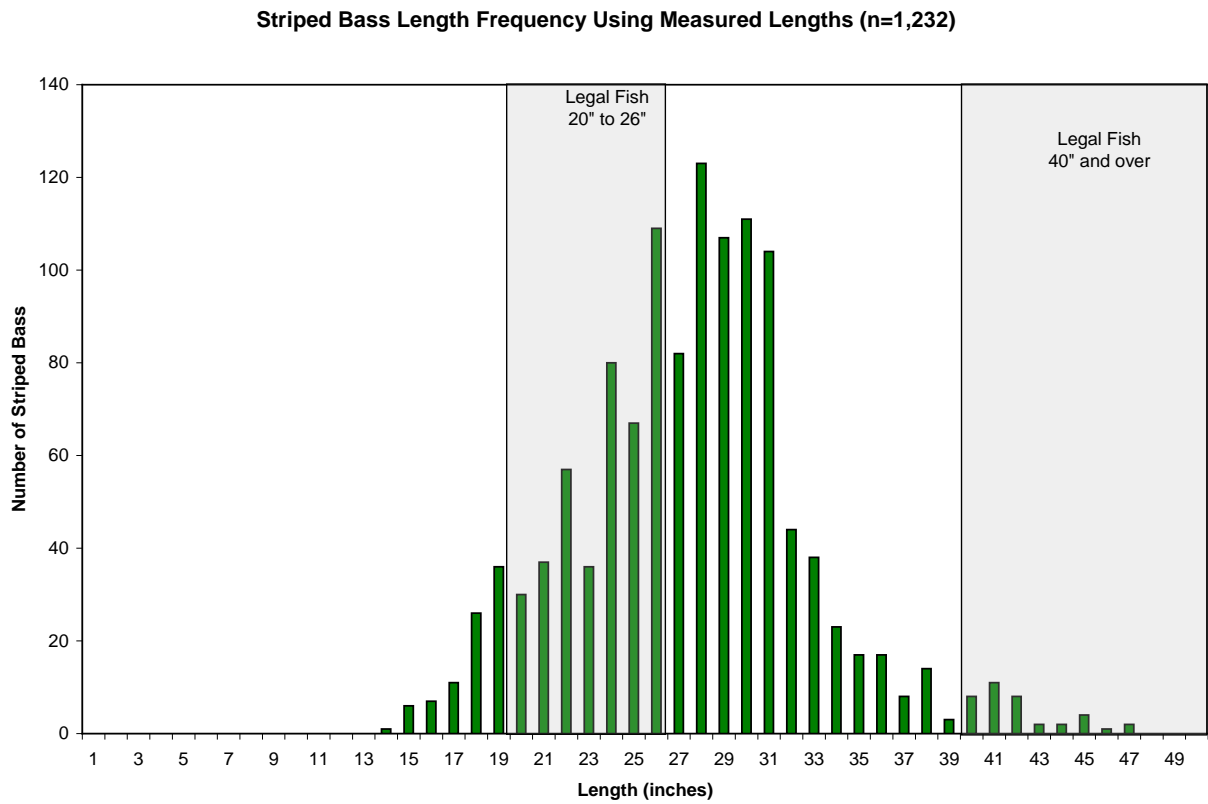




Figure 2. Striped bass length frequency for Maine 2011, based on data from 66 Volunteer Log Books.



# NEW HAMPSHIRE - 2011

## ASMFC Annual State Report for the Striped Bass Fishery

### I. Introduction

During 2011, New Hampshire striped bass catch and harvest by recreational anglers increased sharply from 2010. Effort (angler trips) increased slightly (MRFSS-17%, MRIP-22%) between 2010 and 2011, but remains relatively low. The catch per trip for New Hampshire anglers as measured by a state conducted volunteer angler survey was unchanged from 2009 and remains at the lowest reported since 1994. There were no changes in management measures and monitoring of striped bass in New Hampshire during 2011.

### II. Request for *de minimis*. N/A

### III. Harvest and Losses for 2011

#### A. Commercial Fishery

1. Characterization of fishery
  - a) The taking of striped bass by netting of any form is prohibited.
  - b) The sale of striped bass is prohibited regardless of origin.
2. Characterization of directed harvest. N/A
3. Characterization of other losses. See Law Enforcement report.

#### B. Recreational Fishery

1. Characterization of fishery
  - a) No seasonal restrictions
  - b) Striped bass must be landed with head and tail intact 28 inch minimum size limit
  - c) Two fish per day creel limit, only one fish may be greater than 40 inches
  - d) No gaffing of striped bass allowed
  - e) Culling of striped bass is prohibited
2. Characterization of directed harvest
  - a) Landings and methods of estimation - see Table 1
  - b) Catch composition –see Table 2 and Appendix A.
  - c) Estimation of effort – Table 3
3. Characterization of losses - see Tables 1-3.

#### C. Other losses - none

IV. Required fishery-independent monitoring. - None required.

V. Planned management program for 2012.

There were no changes to New Hampshire's striped bass management program in 2011 and none currently proposed in 2012. Possession of a Recreational Saltwater Fishing License is required for anglers to take, possess, or transport finfish from the coastal and estuarine waters of New Hampshire.

Fis 603.08 Striped Bass.

- (a) No person shall take, possess, or transport striped bass less than 28 inches in total length. Striped bass shall have head and tail intact while on or leaving the waters or shores of the state.
- (b) No person shall possess more than the daily creel limit of two fish, and only one fish may be greater than 40 inches in total length.
- (c) There shall be no closed season for the taking of striped bass.
- (d) The sale of striped bass shall be prohibited regardless of origin.
- (e) The taking of striped bass shall be prohibited by netting in any form except that striped bass may be landed by the use of a hand held dip net.
- (f) The taking of striped bass by gaffing shall be prohibited.
- (g) Striped bass legally taken in Maine, which do not meet the New Hampshire size and creel restrictions shall only be possessed on the waters of the Piscataqua and Salmon Falls rivers. All striped bass landed in New Hampshire shall meet New Hampshire's size and creel restrictions.
- (h) No person shall cull any striped bass taken from or while on the waters under the jurisdiction of the state.

**Table 1. Estimate of striped bass catch, harvest, and release losses in New Hampshire's recreational fishery, 2011.**

	NUMBER		POUNDS		MEAN WT(lbs)/FISH
	MRFSS	MRIP	MRFSS	MRIP	
Total Catch <sup>1</sup>	105,776	131,397	-	-	-
Total Harvest <sup>1</sup>	23,976	32,704	269,921	370,798	11.26
Release Losses <sup>2</sup>	6,544	7,895	46,528	56,137	7.11

1 - Source: NMFS-MRFSS/MRIP

2 - Striped bass released\*0.08

3 - Mean weight of recreationally caught, striped bass in New Hampshire derived by applying length/weight formula  $\log_{10}(\text{pounds}) = -3.463 + 3.007 * \log_{10}(\text{TL inches})$ , RMS=0.0027, (Massachusetts Striped Bass Fishery Monitoring Report - 2011) to length data from New Hampshire Striped Bass Volunteer Angler Survey.

**Table 2. Catch at age estimates from New Hampshire's recreational striped bass fishery, 2011.**

Fishery:	Total #	Total wt	Catch at age											
			2	3	4	5	6	7	8	9	10	11	12	13+
MRFSS Rec. Harvest	23,976	269,921	0	0	765	2,050	6,992	5,482	4,596	1,026	767	374	558	1,366
MRFSS Rec. Discard Mortality	6,544	46,528	115	678	1,299	1,521	1,293	1,058	365	75	52	27	24	38
MRFSS TOTAL	30,520	316,449	115	678	2,064	3,571	8,285	6,540	4,961	1,101	819	401	582	1,404
MRIP Rec. Harvest	32,704	370,798	0	0	1,043	2,796	9,538	7,477	6,269	1,400	1,047	510	761	1,863
MRIP Rec. Discard Mortality	7,895	56,137	139	817	1,577	1,835	1,560	1,276	441	91	62	33	29	45
MRIP TOTAL	40,599	426,935	139	817	2,620	4,631	11,098	8,753	6,710	1,491	1,109	543	790	1,908

**Table 3. Estimates of catch, harvest, release losses, and effort in New Hampshire's recreational fishery for striped bass, 1994-2011.**

Year	Catch		Harvest						Release Losses					Effort	
	#		#		lbs.		Mean wt.		#		lbs.		Mean weight	(angler trips)	
	MRFSS	MRIP	MRFSS	MRIP	MRFSS	MRIP	MRFSS	MRIP	MRFSS	MRIP	MRFSS	MRIP		MRFSS	MRIP
2011	105,776	131,397	23,976	32,704	269,921	370,798	11.3	11.3	6,544	7,895	46,528	56,137	7.1	294,566	296,570
2010	49,513	57,781	5,089	5,948	53,963	67,409	10.6	11.3	3,554	4,147	23,664	27,617	6.7	251,969	243,075
2009	76,348	66,030	10,761	8,587	146,005	113,705	13.6	13.2	5,247	4,595	30,614	26,791	5.9	414,337	400,587
2008	90,175	82,545	6,642	5,308	92,178	73,807	13.9	13.9	6,683	6,179	35,351	32,687	5.3	348,590	332,539
2007	296,055	263,720	7,070	6,348	73,283	68,142	10.4	10.7	23,119	20,590	84,616	75,359	3.7	537,684	501,517
2006	582,640	474,136	14,748	13,521	212,012	179,181	14.4	13.3	45,431	36,849	127,214	103,178	2.8	546,952	501,320
2005	538,797	597,573	26,026	24,940	291,663	281,114	11.2	11.3	41,022	45,811	151,780	169,499	3.7	520,433	504,774
2004	207,165	234,163	10,359	8,386	121,565	98,995	11.7	12	15,744	18,062	70,850	81,280	4.5	360,359	343,160
2003	285,045	NA	24,878	NA	281,548	NA	11.3	NA	20,813	NA	82,005	NA	3.9	415,763	NA
2002	250,860	NA	12,857	NA	152,343	NA	11.8	NA	19,040	NA	90,250	NA	4.7	318,430	NA
2001	179,628	NA	15,291	NA	223,072	NA	14.6	NA	13,147	NA	91,898	NA	7	360,098	NA
2000	213,868	NA	4,262	NA	71,370	NA	16.7	NA	16,768	NA	91,386	NA	5.5	367,899	NA
1999	150,371	NA	4,641	NA	84,256	NA	18.2	NA	11,658	NA	69,948	NA	6	285,303	NA
1998	249,229	NA	5,929	NA	114,341	NA	19.3	NA	19,464	NA	97,320	NA	5	276,670	NA
1997	292,844	NA	13,546	NA	206,904	NA	15.3	NA	22,344	NA	114,142	NA	5.1	337,836	NA
1996	299,281	NA	6,461	NA	102,271	NA	15.8	NA	23,426	NA	87,476	NA	4.1	265,065	NA
1995	289,388	NA	3,902	NA	67,992	NA	17.4	NA	22,839	NA		NA		299,763	NA
1994	46,524	NA	3,023	NA	66,017	NA	21.8	NA	3,480	NA		NA		314,034	NA

APPENDIX A. Progress report of New Hampshire's Volunteer Angler Creel Survey for striped bass anglers, 2011.

PROGRESS REPORT

State: New Hampshire Grant: F-61-R

Title: NEW HAMPSHIRE'S MARINE FISHERIES INVESTIGATIONS

Project I: ANADROMOUS FISH INVESTIGATIONS

Job 5: Volunteer Angler Creel Survey for Striped Bass Anglers

Objective: To annually monitor the recreational fishery for striped bass in New Hampshire waters in order to identify trends and evaluate the effect of management measures.

Period Covered: January 1, 2011 - December 31, 2011

Abstract:

Forty-one anglers participated in New Hampshire's Volunteer Angler Creel Survey for striped bass during 2011. The anglers reported on 638 fishing trips (approximately 2,571 angler hours) directed at striped bass in New Hampshire waters. Catch per unit effort indices from this survey remained low compared to historical values in 2011.

The percentage of trips where flies were used as terminal tackle continues to decline, lures also saw a slight decline in use in 2011. The use of bait has remained the preferred method over the. The shifting terminal tackle preferences of New Hampshire anglers may be a contributing factor to the recent increase in the number of legal fish being caught by participants due to a possible gear selectivity of bait toward larger fish.

A reported 1,314 striped bass were caught in 2011, and volunteers provided length data on 1,231 (94%) of those fish. Lengths ranged from 14 to 44 inches, and 66% were from sub-legal size fish that would not have been obtained by conventional shore-based creel surveys. The mean length of fish caught increased 26.5 inches in 2011. A strong recruitment of the 2003 year class may be represented by the dominance of certain size ranges of striped bass between 2006 and 2011.

## Introduction:

Striped bass (*Morone saxatilis*) has traditionally been an important component of the marine recreational fishery in New Hampshire. The increased abundance of striped bass observed in the 1990s translated into increased effort in the recreational fishery for this species in New Hampshire.

The Marine Recreational Survey (MRS), conducted by the New Hampshire Fish and Game Department and the National Oceanographic and Atmospheric Administration Fisheries Service (NOAA Fisheries) in New Hampshire, is a general purpose survey that provides basic catch and effort data about the fishery. More specific information about the striped bass fishery, such as the relative use of different terminal tackle types and size distribution of sub-legal and legal fish that are released, would aid in the management of this fishery.

To gain additional information specific to this important recreational fishery in New Hampshire, the New Hampshire Fish and Game Department (Department) developed and implemented a Striped Bass Volunteer Angler Survey Program (SBVAS) for striped bass in 1993. The program is used to obtain information about the fishery that will assist managers in efforts to effectively manage the striped bass resource along the New Hampshire and other Atlantic states' coasts.

## Procedures:

Volunteer angler logbooks were distributed to anglers who expressed a willingness to participate in the program. Anglers were solicited at marinas, public access sites, sportsman's clubs, in publications released by the Department, on recreational fishing websites, and at public informational meetings concerning striped bass.

The local chapter of the Coastal Conservation Association (CCA-NH) assisted by providing a membership list to the Department so survey forms could be sent to all members. In addition, they donated a signed and framed striped bass print to the Department to be raffled to one survey participant. In 2011, a second prize was added. Kittery Trading Post donated a rod and reel to the Department to be raffled to one additional participant.

The survey logbooks provided space for collecting the following information: angler's name and address, trip date, number of hours fished, number of anglers in party, number of fish caught and kept, number of fish caught and released, number of legal size fish released, whether fishing occurred from boat or shore, the terminal tackle used, and length measurements (total length to the nearest inch) of any striped bass caught. Instructions completing the logbooks were included on the form. Participants were also given the opportunity to electronically submit logbook information in a

spreadsheet format through e-mail.

Letters were sent out at the end of the fishing season in November to remind anglers to submit the logbooks. Those anglers that did supply a record of their fishing effort and catch were provided with a letter that summarized their individual data, as well as, the combined data of all participants.

If anglers reported measurements as ranges that were in increments greater than four inches, they were omitted because such large increments can include the entire size range of several different age groups. To utilize the smaller range measurements ( $\leq 4$  inches), the lengths of the fish reportedly caught in a given size range were sequentially apportioned to lengths within the range in one-inch increments with the central values having the greatest probability of being used. For example, a report of four fish between 12 and 14 inches would be assigned length values as follows: 12, 13, 13, and 14 inches. This method seems appropriate for the small range increments at the lower fish sizes because average annual growth of striped bass less than 25 inches is approximately 4 to 6 inches per year.

Summary statistics were calculated for all logbook and length data received. Comparisons of reported catch and harvest rates were made to MRS and stock assessment data using standard correlations to produce Pearson's product moment correlation coefficients. Mean lengths of striped bass harvested by three separate tackle types (bait, lure, fly) were analyzed using a one-way ANOVA, and pair-wise combinations were made using Tukey's (HSD) Studentized Range test.

#### Results:

In 2011, forty-one anglers provided information on 638 trips, accounting for 2,571 angler hours directed at striped bass via the Striped Bass Volunteer Angler Survey Program (Table 5-1). Anglers reported catching a total of 1,314 striped bass this year, 472 (36%) of which were of legal size. Of all the fish caught, approximately 12% were harvested, 67% of the legal size fish were released alive, and 88% of the entire catch was released.

The majority of the trips taken (75%) were from a boat, and bait was the most commonly used terminal tackle (Table 5-1). The percentage of trips using bait has made up the majority of trips since the inception of this survey; however, in 2011 there was a large jump from the average of 60% to 73% this past season. Trips using lures have remained relatively constant since 2003, ranging from a low of 24% in 2004 to a high of 33% in 2005. The use of flies as terminal tackle has steadily declined since the high of 41% of trips in 2000 to the second lowest percentage on record in 2011 where it fell to a mere 10% of all trips. A consistently reduced proportion of legal size fish caught using lures and fly, in relation to bait is clearly exhibited in Figure 5-1.



The catch per trip for survey participants remained steady for two years at 2.1 striped bass per trip and has remained between 2.1 and 2.4 striped bass per trip since 2008. The stabilization in this index of catch per unit effort (CPUE) followed a 50% drop from 2007 to 2008 (Table 5-1). The 2011 catch per trip value is at the second lowest level in the time series, only 1993 showed a lower value; whereas the catch per hour fished rate is the lowest on record. Average catch per hour fished declined by 12% from 2010. In contrast, the 2011 harvest of 0.06 striped bass per hour is higher than the time series average as is the catch of legal size fish per hour. Comparisons of catch rates from the MRS to this survey are shown in Figures 5-2 and 5-3, indicating a strong significant correlation between the two independent surveys.

Length measurements were provided on 1,231 striped bass ranging from 14 to 44 inches total length (Table 5-2). Sixty-six percent of all reported length measurements were of sub-legal size fish (< 28 inches), with the mean length of fish measured being 26.5 inches. The influence of terminal tackle on proportional encounters with legal size fish and the mean length of fish caught are shown for each tackle type in Figures 5-4 and 5-5. The distributions of all lengths in a sample year, as well as, the mean length of fish reported among all anglers and tackle types are depicted in Figure 5-6.

#### Discussion:

Annual participation in the Department's Striped Bass Volunteer Angler Survey remained relatively constant over the past ten years with the exception of 2010 (Table 5-1). This year's participation by 41 volunteer anglers is just above the average participation of 40 anglers per year since 1995. The number of reporting anglers increased in 2000 most likely due to CCA-NH's assistance in providing access to their membership list for solicitation of new participants, as well as, providing raffle opportunities of framed limited edition prints as an incentive. Despite efforts, the voluntary design of the SBVAS results in consistently low response rates each year, and retention of participants for more than two years has been difficult. In 2011, 334 individuals comprised primarily of CCA-NH members and past survey participants were directly contacted by the Department a 75% increase in solicitation over 2010 when 191 individuals were contacted. Forty-one anglers provided fishing information in 2011, a 12% response rate. Seven of the anglers contacted signed up to receive logbooks after reading of the program in the Department's fishing report, distributed by email. Five of these anglers sent their logbooks in at the end of the season. A few individuals also read of the program on the Department's website and inquired by phone, only one quarter of those anglers returned their logbooks. In addition, twenty-two charter boat

captains were also solicited in 2011 with three of them agreeing to participate at the beginning of the season; logbooks were not received from any of these individuals.

In 2011, nine anglers submitted electronic spreadsheets through e-mail, an increase from one angler the previous year. Considering that the majority of new participants resulted from electronic communications and with the increase in the preference for electronic reporting, the diversification into other electronic options such as web-based submission of single trip information may allow for increased data collection in coming years.

A second incentive was added in 2011. Kittery Trading Post donated a rod and reel combo to be raffled off along with the print donated annually by CCA-NH. There was an increase in participation over 2010, but the response rate remained the same at 12%. With the level response rate it is likely the increased solicitation and not the added incentive which caused an increase in participation over 2010. Given that the response rate did not increase with added incentive in 2011, a greater recruiting effort should be made in the future, especially to the internet audience.

Catch and effort information collected through the SBVAS was used to quantify CPUE, as both striped bass caught per angler trip and striped bass caught per hour fished (Table 5-1). Both forms of catch rate remain very low in comparison to historical values and the catch per hour fished value is the lowest seen since the survey's inception. When comparing SBVAS catch rates to those generated by the MRS for striped bass directed trips in New Hampshire, the MRS rates are consistently lower in magnitude (NOAA Fisheries: Office of Science and Technology, 2011), but exhibit a nearly identical trend from year to year (Figure 5-2). A correlation analysis of the SBVAS CPUE and the MRS CPUE between 1993 and 2011 resulted in a correlation coefficient of  $r = 0.758$ , indicating a correlation between the two was significant ( $P\text{-value} < 0.001$ ). The similarity of results between the two independently conducted surveys would suggest that the current angler sample size of the SBVAS is sufficient for providing variation in catch rates from year to year.

Like catch data, harvest information was used to calculate harvest rates in harvest per trip and harvest per hour fished (Table 5-1). Measures of harvest rates had been trending steadily downward, dropping from 0.36 striped bass per trip in 2001 to only 0.15 striped bass per trip in 2008, but during the past three years this measure of harvest rate rebounded up to 0.32 in 2010 and remains above average for 2011 with a value of 0.25 striped bass harvested per trip. Harvest per hour had decreased from 0.07 to 0.04 striped bass per hour fished over the same period, but also increased to 0.09 in 2010 and remains above average at 0.06 striped bass per angling hour in 2011.

Participants in this survey provided length information on 1,231 striped bass this year (Table 5-2). Length measurements provided by the SBVAS are important to the coast-wide stock assessment for striped bass to characterize the catch from recreational anglers in New Hampshire. The Department has continued to promote the high importance of providing length measurements through communications related to this survey program, and as a result, this year anglers provided measurements of 94% of all fish encountered. Similarly, the efforts to reduce the amount of lengths reported in ranges has also been beneficial to the quality of length information collected, with only two participants' length measurements having to be omitted this year from the length-frequency analysis because the reported range was greater than four inches. Thirty-two lengths were recorded in ranges of four inches or less, 3% of those reported. Sixty-six percent of all reported measurements were sub-legal fish that would not have been obtained by conventional creel surveys. Interestingly, as the harvest rates have increased in the last few years the mean length of those fish encountered have also increased, showing that as anglers are catching fewer fish, those that they catch are more likely to be legal size.

One possible explanation for greater encounters with legal size fish is a change in terminal tackle preference by anglers in recent years. Figure 5-1 illustrates that since 1995, using bait consistently resulted in a higher proportion of legal size fish caught than using either lures or flies. This may indicate fishing with flies or lures may be selective towards smaller fish. Further evidence of bait predominately selecting for legal fish is indicated in Figure 5-4 as angling trips utilizing lures has recently decreased and bait utilization has increased. In addition, Figure 5-5 plots the length frequency of fish caught on the three terminal tackle types reported on in 2011, and indicates that the mean length of fish caught using solely bait as terminal tackle will be significantly different than that of fish caught using lure or fly ( $P < 0.01$ ). The analysis of variance (ANOVA) and post hoc analysis indicate that by using bait an angler is more likely to catch a larger fish than an angler using either a lure or fly. In 2011, there was no significant difference in the mean length of fish caught using a lure versus a fly. Therefore, a increased tackle preference of lures or flies over bait should result in a greater proportion of sub-legal fish caught, potentially resulting in a lowered mean length of fish caught annually. Inversely, increased preference of bait should raise the mean length of reported fish. Comparing Table 5-1 and Figure 5-6 strengthens this idea; due to the fact that bait preference rose from 2007 to 2011 and a corresponding rise in mean length of reported fish during those years.

Another potential explanation of recent decline of sub-legal size fish may be related to variations in success of certain cohorts of striped bass. Annual SBVAS information, like the shifting distributions of reported lengths, may help to provide insight into recruitment success into the recreational fishery. The Atlantic States Marine Fisheries Commission's (ASMFC) 46<sup>th</sup> Northeast Regional Stock Assessment Workshop indicated that the 2003 cohort recruitment was the greatest (22.3 million fish at age 1 in 2004) followed closely by the 1993 cohort (20.6 million fish at age 1 in 1994). Since striped bass generally do not migrate before age 3 (Collette, Bruce B and Klein-MacPhee, Grace. 2002), it would be expected that these large cohorts would be available to New Hampshire anglers during 2006 and 1996, respectively. These year classes do coincide with two of the highest calculated CPUEs (catch/hr fished) over the history of the SBVAS (Table 5-1) and analysis of the two indices, shown in Figure 5-3, indicated a strong significant correlation ( $r = 0.71$ ,  $P\text{-value} < 0.01$ ). However, the stock assessment estimated the lowest striped bass recruitment since 1993 occurred from the 1999 and 2002 cohorts, which do not correspond with unusually low SBVAS CPUEs in 2002 and 2005. As such, we may not draw conclusions about poor recruitment from the survey; however the decrease in sub-legal size fish being caught recently does raise some questions about recruitment success.

A age-length key produced by the Massachusetts Division of Marine Fisheries in 2011, characterized most fish between approximately 13 and 17 inches as age 3, fish between 18 and 20 inches as ages 3 and 4, fish between 21 and 24 inches as ages 4 and 5, and fish between 25 and 27 as ages 5 and 6 (Nelson, G., Personal Communication). Using this age-length structure to translate reported length data from the survey into likely corresponding ages, also suggests that the 2003 cohort was exceptionally strong. Figure 5-6 shows the mean length of reported fish between 2006 and 2010 has increased steadily at a rate that nearly mirrors the predicted lengths of the 2003 cohort in each of those years. However, without directly sampling the population of striped bass in New Hampshire waters for age it is difficult to be assured the pulse is in fact a result of the strong 2003 cohort.

While SBVAS data may indicate elevated catch rates follow high recruitment years, it does not show reduced catch rates from poor recruitment years. This may support angler logbook information as useful to state-specific analysis only. Using catch and harvest information from the SBVAS to make inferences about the health or status of striped bass stocks coastwide has proven difficult. Scatter plots of both SBVAS catch and harvest rates against total stock estimates from the most recent striped bass stock assessment show significant moderate correlations, with coefficients of determination at 0.51 and 0.18 respectively (Figure 5-3). It is likely that

annual catch and harvest rates determined from the SBVAS may only reflect the availability of striped bass within New Hampshire waters on a given year. Northward migrating striped bass populations may vary greatly from year to year dependant upon factors such as weather, water temperatures, and abundance of prey. Therefore, while the SBVAS is useful in demonstrating trends in angler effort and success within state waters, it should be noted that the fluctuations in striped bass abundance within the coastal waters of New Hampshire should not be used alone in drawing conclusions about the coastwide striped bass population size and structure.

In conclusion, survey participation has risen sharply since the program's inception; this year's participation of 41 anglers is just above the average level since 1995. A concerted effort should be made to recruit more anglers to the program. While the survey may benefit from an increase in sample size, comparisons to the MRS show a strong significant correlation in inter-annual trends. Catch rates over the last four years have been the lowest values since 1994 and a substantial change since peak catch rates only six years ago. Harvest rates, however, exhibited a rise to levels that near the relative peaks measured by the survey program in 2001 when the 28 inch minimum size limit went into effect. The reported length data indicated that more than 66% of fish caught were of sub-legal size in 2011, primarily fish between 24 and 27 inches, which produced a mean size of 26.5 inches for fish caught this year. The consistently increased use of bait and decreased use of flies in recent years by survey participants may be contributing to trips where more legal size fish may be caught, as well as, an exceptionally strong 2003 cohort. Finally, an analysis between SBVAS data and stock assessment data over the entire time series suggest that data, such as catch and harvest rates, should not be solely used in making decisions on the status of striped bass stocks coastwide, but rather the availability to New Hampshire.

References:

- ASMFC. 2008. 46<sup>th</sup> Northeast Regional Stock Assessment Workshop (46<sup>th</sup> SAW). Assessment Summary Report. Northeast Fisheries Science Center Reference Document 08-01. 32p.
- Collette, Bruce B and Klein-MacPhee, Grace. 2002. Bigelow and Schroeder's fishes of the Gulf of Maine-3<sup>rd</sup> ed, p.377-389. Smithsonian Institution Press, Washington DC.
- Nelson, G.. Personal Communication. Massachusetts Division of Marine Fisheries, Annisquam River Marine Fisheries Field Station, 30 Emerson Ave., Gloucester, MA.
- NOAA Fisheries: Office of Science and Technology. (2011). MRFSS Queries: Custom Queries. Retrieved December, 2011, from <http://www.st.nmfs.gov/st1/recreational/queries/custom>


**Table 5-1. Summary of data reported by participants in New Hampshire Fish and Game Department's Striped Bass Volunteer Angler Survey, 1993-2011.**

	1993	1994	1995*	1996	1997	1998	1999	2000	2001'	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Reporting Anglers	9	13	26	33	32	29	25	46	43	58	50	46	44	45	45	49	47	24	41
# of Trips	333	403	922	1,402	1,104	1,492	1,184	1,504	1,442	1,738	990	1,219	984	1,045	1,027	856	689	489	638
Angler Hours	1042	1340	3,770	5,700	4,634	6,884	5,322	6,346	7,126	7,015	3,814	5,253	3,745	3,919	4,036	3,240	2,335	1,814	2,571
Total Stripers Caught	571	1040	4,108	7,744	6,341	8,673	5,469	6,377	5,450	7,603	4,093	4,174	4,406	6,118	4,265	1,834	1,667	1,050	1,314
Total Stripers Harvested	28	31	86	178	139	499	400	276	518	434	141	320	218	161	173	129	142	155	158
Total Legal Size Fish Released	45	118	177	427	458	628	519	243	837	798	561	248	214	194	68	114	140	154	314
Fishing Type (percent)																			
Boat	95%	77%	80%	70%	69%	85%	87%	82%	89%	72%	73%	75%	84%	81%	87%	82%	84%	77%	75%
Shore	5%	23%	20%	30%	31%	15%	13%	18%	11%	28%	27%	25%	16%	19%	13%	18%	16%	23%	25%
Tackle Type (percent)																			
Bait	89%	72%	61%	52%	65%	69%	66%	54%	61%	54%	53%	51%	52%	46%	51%	62%	63%	59%	73%
Lure	14%	21%	18%	15%	13%	17%	16%	19%	13%	14%	26%	24%	33%	31%	31%	32%	29%	31%	27%
Fly	3%	15%	35%	34%	39%	32%	29%	41%	39%	36%	32%	33%	28%	34%	27%	20%	19%	15%	10%
Catch/Trip	1.7	2.6	4.5	5.5	5.7	5.8	4.6	4.2	3.8	4.4	4.1	3.4	4.5	5.9	4.2	2.1	2.4	2.1	2.1
Harvest/Trip	0.08	0.08	0.09	0.13	0.13	0.33	0.34	0.18	0.36	0.25	0.14	0.26	0.22	0.15	0.17	0.15	0.21	0.32	0.25
Catch/Hr. Fished	0.55	0.78	1.09	1.36	1.37	1.26	1.03	1.00	0.76	1.08	1.07	0.80	1.18	1.56	1.06	0.57	0.71	0.58	0.51
Legal Catch/Hr. Fished	0.07	0.11	0.07	0.11	0.13	0.16	0.17	0.08	0.19	0.18	0.18	0.11	0.12	0.09	0.06	0.08	0.12	0.17	0.18
Harvest/Hr. Fished	0.03	0.02	0.02	0.03	0.03	0.07	0.08	0.04	0.07	0.06	0.04	0.06	0.06	0.04	0.04	0.04	0.06	0.09	0.06
% Caught & Released	95%	97%	98%	98%	98%	94%	93%	96%	91%	94%	97%	92%	95%	97%	96%	93%	92%	85%	88%
% Legal Size Released	63%	79%	67%	71%	77%	56%	56%	47%	62%	65%	80%	43%	50%	55%	28%	47%	50%	50%	67%

\*1995 - Size limit changed from 36 to 32 inches.  
+2001 - Size limit changed from 32 to 28 inches.

**Table 5-2. Length frequency data for striped bass measured by anglers participating in New Hampshire's Striped Bass Volunteer Angler Survey, 2011.**

Length (inches)	Number of Occurrences	Percent (%)
14	2	0.16%
15	2	0.16%
16	3	0.24%
17	3	0.24%
18	37	3.01%
19	17	1.38%
20	49	3.98%
21	29	2.36%
22	59	4.79%
23	46	3.74%
24	104	8.45%
25	89	7.23%
26	206	16.73%
27	167	13.57%
28	106	8.61%
29	96	7.80%
30	66	5.36%
31	33	2.68%
32	28	2.27%
33	21	1.71%
34	13	1.06%
35	9	0.73%
36	10	0.81%
37	5	0.41%
38	9	0.73%
39	3	0.24%
40	8	0.65%
41	3	0.24%
42	3	0.24%
43	0	0.00%
44	5	0.41%
N	1,231	
Mean Length	26.5	

 Legal Size Fish



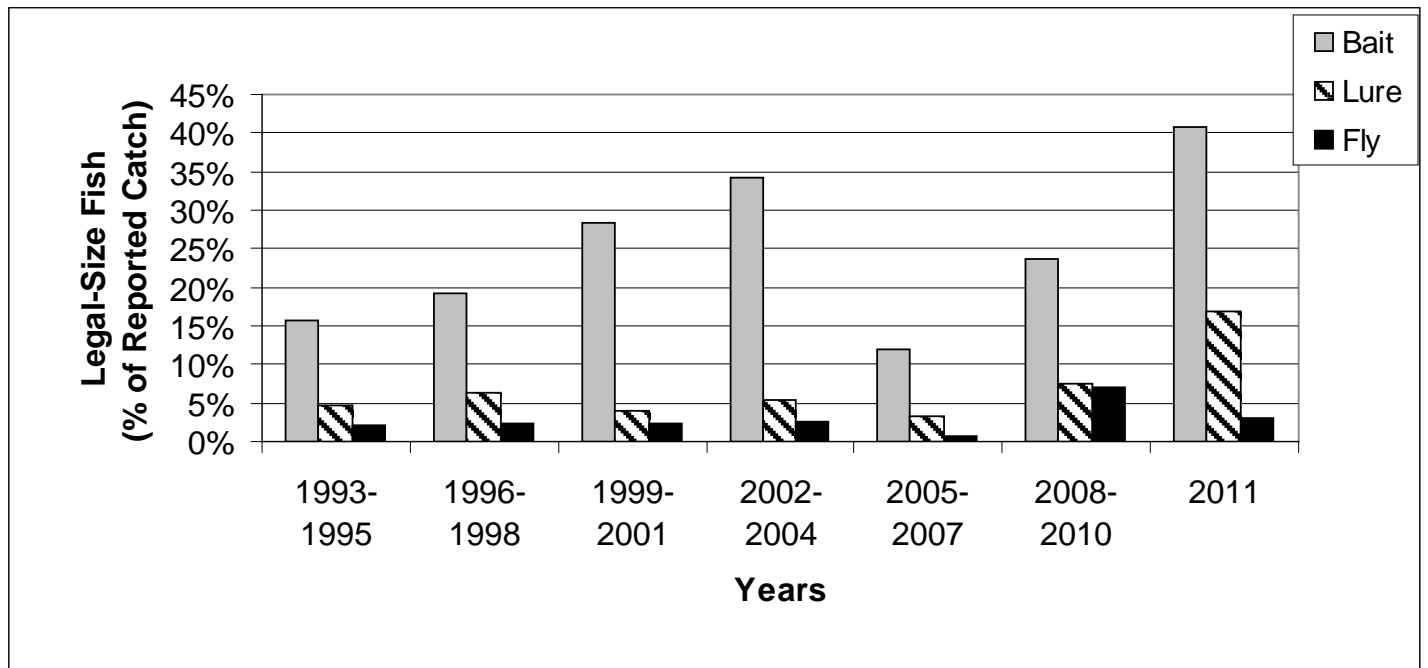


Figure 5-1. Legal size fish encountered as a percentage of total fish reported for each terminal tackle type from the Striped Bass Volunteer Angler Survey, 1993-2011.

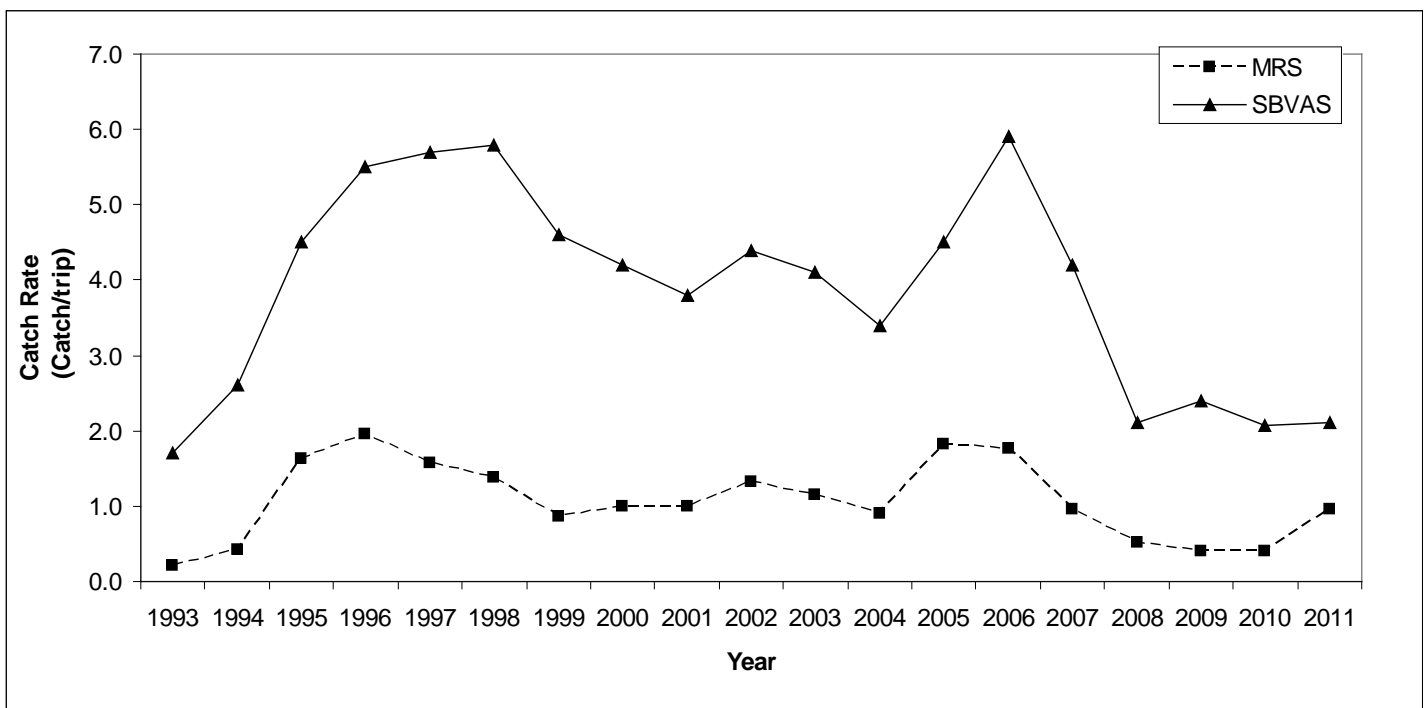
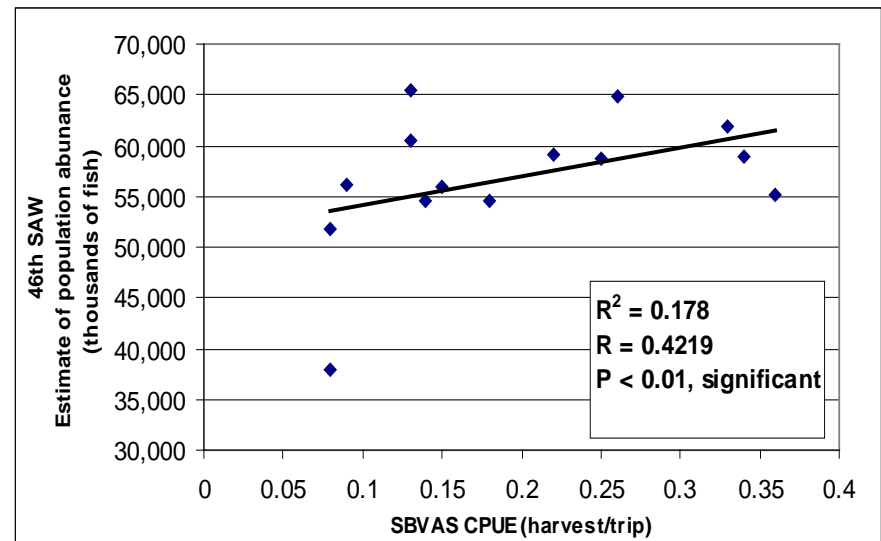
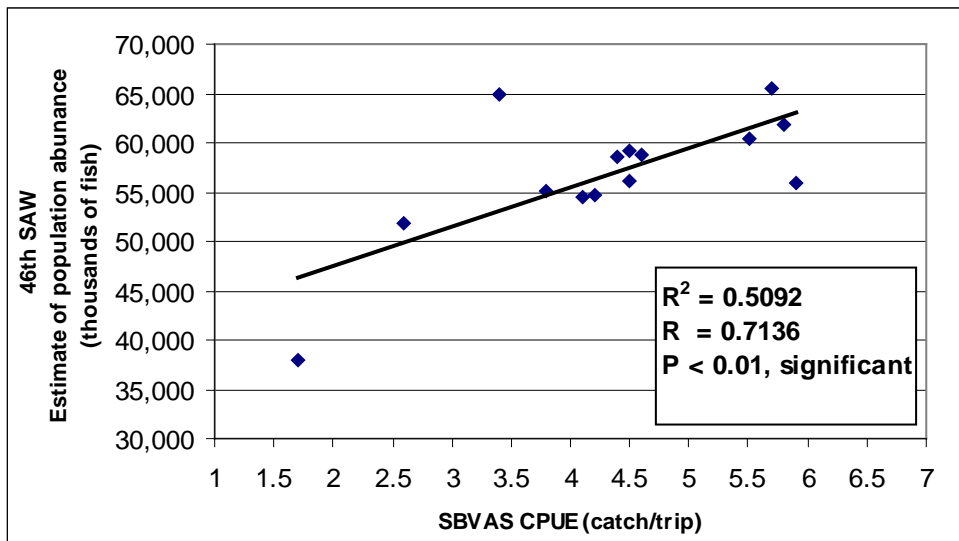
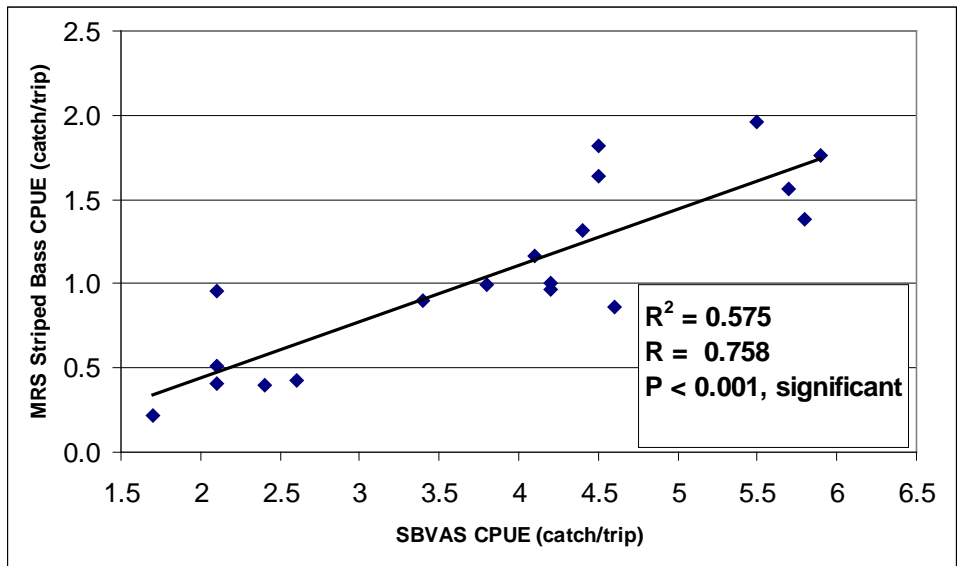


Figure 5-2. Comparison of catch rates generated by the Striped Bass Volunteer Angler Survey and Marine Recreational Survey of directed striped bass trips<sup>+</sup> in New Hampshire waters, 1993-2011\*.

+ Directed trips are defined as those where an angler indicated striped bass as one of the two primary species sought, or where striped bass were caught during a trip.

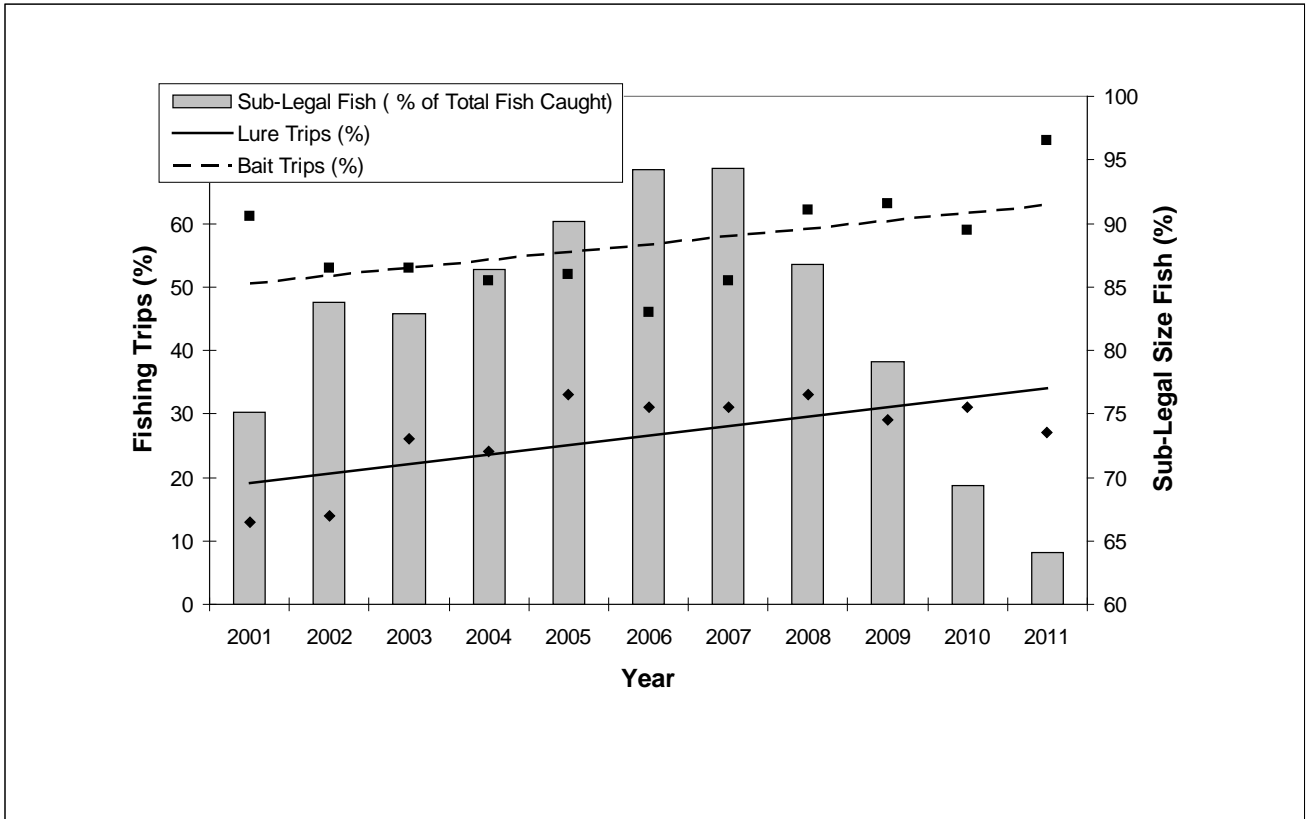
\* 2011 MRS final estimates were not released at the time of this report.



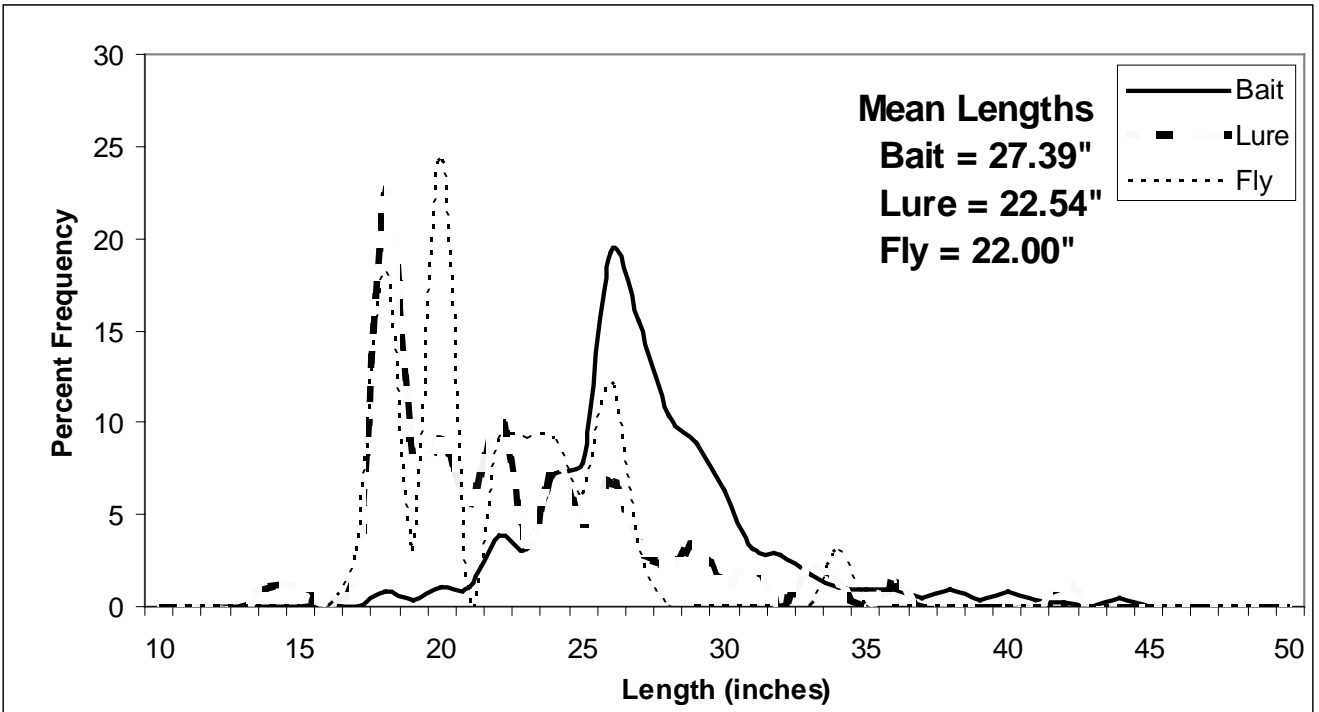
**Figure 5-3. Linear Regressions of catch rates from the Striped Bass Volunteer Angler Survey, Marine Recreational Survey of directed striped bass trips<sup>+</sup>, and the ASMFC 46<sup>th</sup> Stock Assessment Workshop estimates of population abundance estimates in New Hampshire waters, 1993-2011\*.**

<sup>+</sup> Directed trips are defined as those where an angler indicated striped bass as one of the two primary species sought, or where striped bass were caught during a trip.

\* 2011 MRS estimates were preliminary at the time of this report.

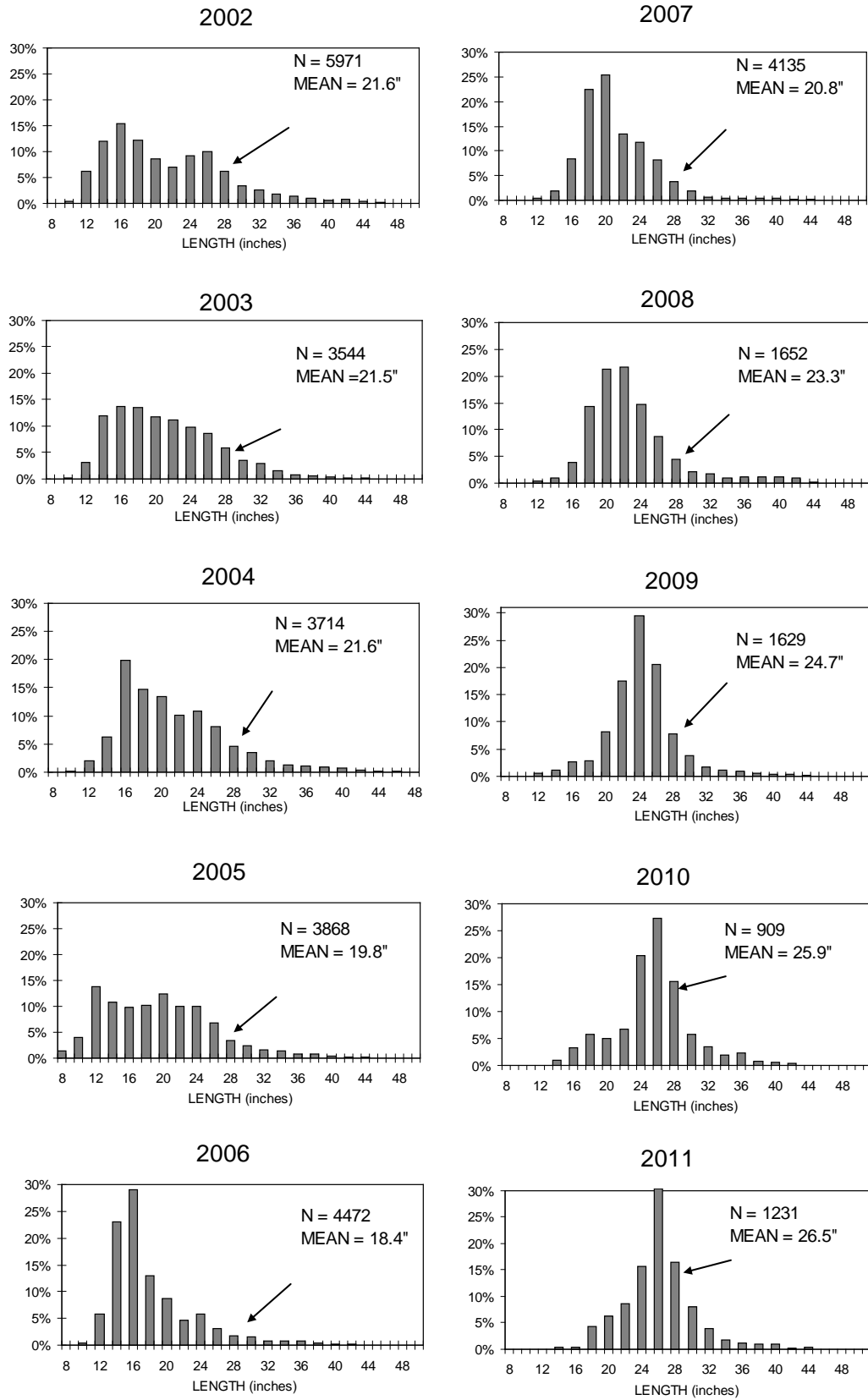


**Figure 5-4. Comparison between terminal tackle selection and proportion of reported sub-legal size fish from the Striped Bass Volunteer Angler Survey, 2001-2011.**



**Figure 5-5. Length frequencies, mean lengths, and between-group comparisons\* of striped bass caught using bait, lure, and fly from the Striped Bass Volunteer Angler Survey, 2011.**

\* Between-group comparisons were done using a One-Way ANOVA and Tukey's (HSD) Studentized Range post hoc tests.



**Figure 5-6. Length frequency comparisons of striped bass from the Striped Bass Volunteer Angler Survey, 2002-2011.**



Massachusetts Division of Marine Fisheries  
Technical Report TR-

# Technical Report

## 2011 Massachusetts Striped Bass Monitoring Report

# Draft

*G. A. Nelson*

Massachusetts Division of Marine Fisheries  
Department of Fish and Game  
Executive Office of Environmental Affairs  
Commonwealth of Massachusetts

June 2012

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# 2011 Massachusetts Striped Bass Monitoring Report

**Gary A. Nelson**

Massachusetts Division of Marine Fisheries  
Annisquam River Marine Fisheries Station  
Gloucester, MA

June 2012

**Massachusetts Division of Marine Fisheries**  
Paul Diodati, Director  
**Department of Fisheries, Wildlife and Environmental Law Enforcement**  
Mary B. Griffin, Commissioner  
**Executive Office of Environmental Affairs**  
Ian Bowles, Jr., Secretary  
**Commonwealth of Massachusetts**  
Deval Patrick, Governor





**Summary:** During 2011, the Massachusetts commercial fishery for striped bass sold about 59,792 fish weighing 1,163,865 pounds and kept approximately 4,662 fish for personal consumption. Total losses due to commercial harvesting (including release mortality) were 70,223 fish weighing 1,290,455 pounds. The recreational fishery harvested about 255,507 striped bass weighing over 3.5 million pounds. Total losses due to recreational fishing (including release mortality) were 333,362 fish weighing over 4 million pounds. Combined losses (including scientific losses) were 403,585 fish weighing over 5.3 million pounds, which reflects a 26% decrease in numbers lost and a 17% decrease in weight lost compared to 2010 (548,664 fish; 6.3 million pounds). The majority of losses, 83% by number and 76% by weight, was attributed to the recreational fishery.

## Introduction

This report summarizes the commercial and recreational striped bass fisheries conducted in Massachusetts during 2011. Data sources used to characterize the state fisheries come from monitoring programs of the Massachusetts Division of Marine Fisheries (DMF) and National Marine Fisheries Service (NMFS), which are considered to be essential elements of the long-term management approach described in Section 3 of the Atlantic States Marine Fisheries Commission's (ASMFC) Fisheries Management Report No. 41 (Amendment #6 to the Interstate Fishery management Plan for Atlantic Striped Bass (IFMP)).

## Commercial Fishery in 2011

*Season:* July 12-August 10. No landings were permitted on Monday, Friday, or Saturday.

*Sold:* 1,163,865 pounds (against a harvest quota of 1,061,898 pounds).

*Allowable Gear Type:* Hook and line.

*Minimum Size:* 34 inches total length.

*Trip Limit:* 5 fish per day on Sunday and 30 fish per day on Tuesday-Thursday.

Licensing, Reporting, and Estimation of Landings. To purchase striped bass directly from fishermen, fish dealers are required to obtain special authorization from the DMF in addition to standard seafood dealer permits. Dealer reporting requirement included weekly reporting to the DMF or SAFIS system of all striped bass purchases. If sent to DMF, all landings information is entered into SAFIS by DMF personnel. Following the close of the season, dealers are also required to provide a written transcript consisting of purchase dates, number of fish, pounds of fish, and names and permit numbers of fishermen from whom they purchased. DMF personnel review dealer transactions and correct entries before calculating total landings.

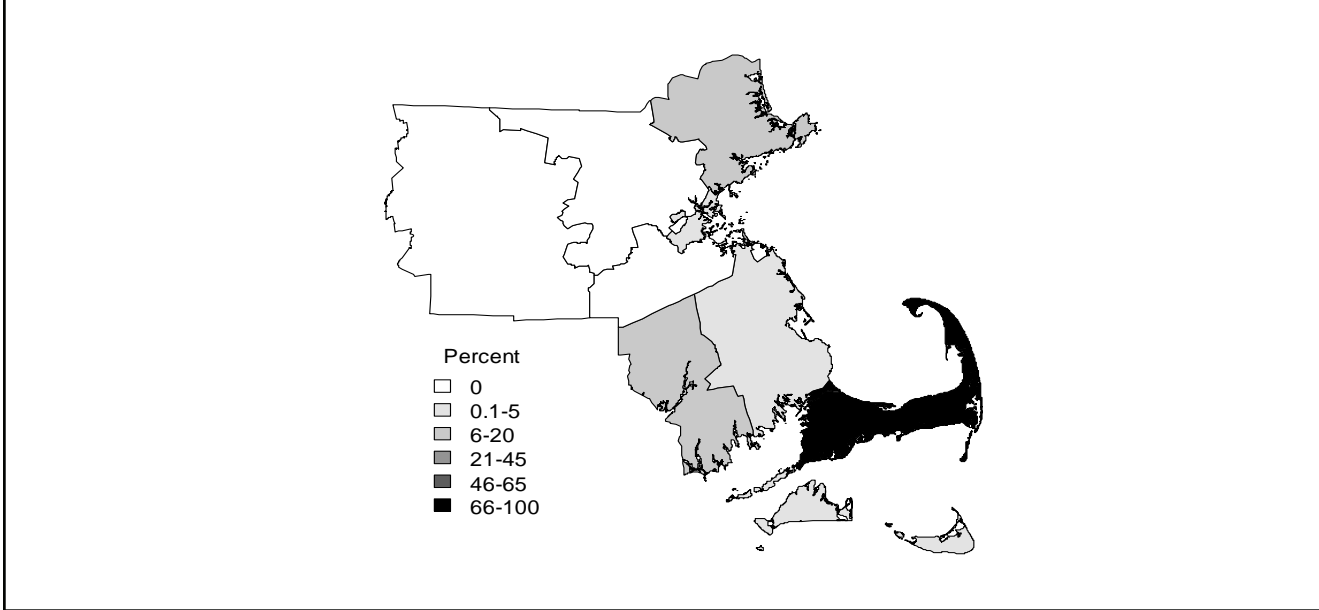
Fishermen must have a DMF commercial fishing permit (of any type) and a special striped bass fishing endorsement to sell their catch. They are required to file monthly trip level reports which

**Table 1.** Attributes of the Massachusetts striped bass commercial fishery, 1990-2011.

Year	Season (Fishing Days)	Purchased		Dealer Permits	Fishing Permits
		Pounds 000s	Number 000s		
1990	93	160.6	6.3	95	1,498
1991	59	234.8	10.4	92	1,739
1992	39	239.2	11.3	135	1,861
1993	35	262.6	13.0	152	2,056
1994	24	199.6	10.4	150	2,367
1995	57	782.0	41.2	161	3,353
1996	42	696.8	38.3	179	3,801
1997	42	785.9	44.8	173	5,500
1998	28	822.0	45.3	180	5,540
1999	40	788.2	40.8	167	3,578
2000	36	779.7	40.2	137	3,283
2001	29	815.0	40.2	164	4,219
2002	21	924.9	44.9	132	4,598
2003	21	1055.4	55.7	151	4,867
2004	19	1206.3	60.6	130	4,376
2005	22	1104.7	59.5	162	4,159
2006	26	1312.1	69.9	136	3,980

Year	Season (Fishing Days)	Purchased		Dealer Permits	Fishing Permits
		Pounds 000s	Number 000s		
2007	22	1040.3	54.3	160	3,906
2008	34	1160.1	61.1	167	3,821
2009	27	1138.3	59.3	178	4,020
2010	24	1224.4	63.0	178	3,951
2011	18	1163.8	59.8	189	3,965

**Figure 1.** Percentage of total pounds of striped bass sold by commercial fishermen in Massachusetts counties in 2011.



include the name of the dealer(s) that they sell to and information describing their catch composition and catch rates

Landings. The landings used here come from the SAFIS system. Commercial anglers sold 1,163,865 pounds (59,792 fish) of striped bass in 2011 (Table 1). Most striped bass were sold in Barnstable, Bristol and Essex counties of Massachusetts (Figure 1). Commercial fishers kept an additional 4,662 fish weighing approximately 71,766 pounds for personal consumption.

Size Composition. Information from biological sampling, catch reports and voluntary logs is used to characterize disposition of the catch, catch weight, and size composition by catch category. Data from 2,848 fish sampled from the 2011 commercial harvest and 2000 DMF diet study were used to construct a length-weight equation to

$$\log_{10}(W) = -3.463 + 3.007 * \log_{10}(L),$$

$$RMS = 0.0027$$

estimate weight-at-size for individual bass. The following geometric regression was derived:

$$W = 10^{(-3.463 + 3.007 * \log_{10}(L) + RMS / 2)}$$

where W equals weight in pounds, L equals total length in inches, and RMS is the residual mean square error. This equation was used to estimate the arithmetic average weight for given lengths by back-transforming the geometric weight as follows:

Size composition of the commercial catch by

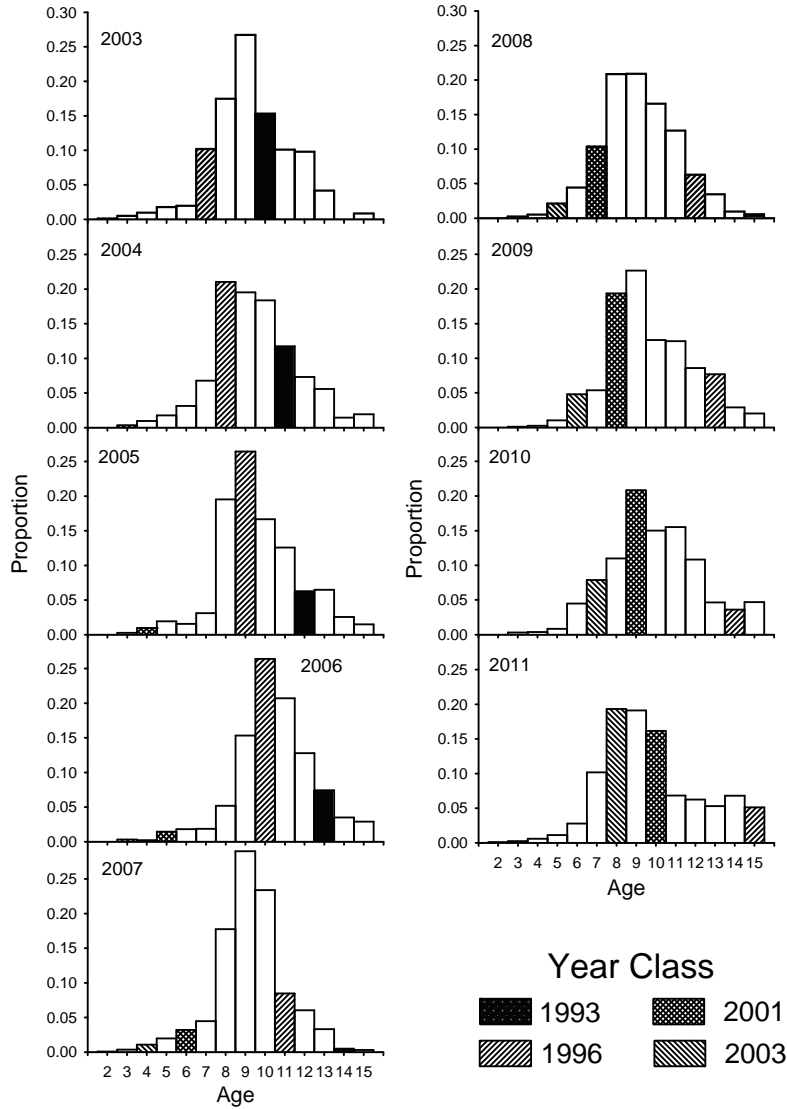
category of disposition is presented in Appendix Tables 1A (numbers of fish) and 1B (pounds of fish). About 43% of all fish caught had lengths  $\geq 34$  inches.

Age and Sex Composition. Four hundred and fourteen striped bass sampled from the 2011 commercial harvest were used to sex and age the harvested fish. The proportion that each age comprised the total samples was estimated from a sub-sample of 358 fish which guaranteed a precision of  $\pm 10\%$  at  $\alpha = 0.05$ . Weighted proportions-at-age were generated by weighting the age proportions sampled in each county by county landings. Age was determined from scales and sex was determined by visual inspection of gonadal tissue (Sykes Method). Age ranged from 7 to 16+ years, and 99.7% were females. About 80% of the sub-sample consisted of individuals from the 1999-2003 year classes (ages 8-12) (Table 2). Peak numbers-at-age of the total catches (harvest plus

**Table 2.** Age composition of the 2011 commercial (purchased by dealers) landings.

Age	Year Class	Number	%	Weighted	
				Mean Length (in.)	Mean Weight (lbs)
6	2005	-	-	-	-
7	2004	10	7.6	33.6	13.3
8	2003	51	18.9	34.6	14.9
9	2002	56	21.0	35.9	16.6
10	2001	64	18.1	37.8	19.0
11	2000	34	7.7	38.4	21.4
12	1999	44	7.1	39.5	22.4
13	1998	41	6.0	42.0	27.3
14	1997	38	7.8	43.0	28.9
15	1996	15	4.6	43.6	32.2
16+	>1995	5	1.3	42.0	23.9

**Figure 2.** Age composition (proportion) of total catches from the Massachusetts commercial fishery.



releases plus consumed) were from the 2003 year-class (Figure 2).

Estimates of Total Catch and Harvest Rates. Estimates of harvest rates (pounds of fish harvested per hour) for the commercial fishery were developed in order to provide an index that may be indicative of fishing success. In 2011, DMF switched to trip-level reporting. Significant information has been lost due to the generalization of the report to cover all fisheries in Massachusetts. The only information now available is daily total hours fished, pounds of fish sold and consumed, and area fished. This information was used under a generalized linear model (GLM) framework to generate standardized indices (Hilborn and Walter, 1992). Each record represented the summarization of a permit’s pounds harvested and hours fished by year, month, and area fished reduced to 4 regions (Cape Cod Canal, Southern MA, Cape Cod Bay,

North MA). Only data from July-August were used to constraint analyses to the most recent duration of the fishing season. The harvest rates for each record was calculated by dividing the total pounds caught by the total number of hours fished. The harvest rate was standardized using the GLM model

$$\ln(y) = a + \sum_{i=1}^n b_i X_i + e$$

where  $y$  is the observed total catch or harvest rate,  $a$  is the intercept,  $b_i$  is the slope coefficient of the  $i$ th factor,  $X_i$  is the  $i$ th categorical variable, and  $e$  is the error term. Any variable not significant at  $\alpha = 0.05$  with type-II (partial) sum of squares was dropped from the initial GLM model and the analysis was repeated. First-order interactions were not considered in the analyses. The back-transformed geometric mean for each year was estimated by

$$\hat{y} = \exp^{(LSM)}$$

where LSM is the least-squares natural log mean of each year.

Results of the GLM analyses of harvest rates are shown in Appendix Tables 2. Although factors were significant, the variables accounted for only about 9% of the total variation in harvest rates.

Harvest rates steadily increased after 1999, peaked in 2004, dropped through 2008, increased slightly through 2010 and then dramatically increased in 2011 (Figure 3A). The dramatic increase in harvest rates for 2011 is attributed to large increases in harvest rates by fishers in Cape Cod Bay and Southern Massachusetts (Figure 3B). The reason for the increase was due to atypical, large concentrations of striped bass off Cape Cod, particularly Chatham, in 2011 for unknown reasons which likely increased the vulnerability of striped bass to capture. In addition, the large 2003 year-class became nearly fully-recruited to the Massachusetts fishery (Figure 2).

Characterization of Other Losses. Release mortality was estimated by using a hook-release mortality rate of 8% applied against the released fish in Appendix Tables 1A and 1B. Total losses due to release mortality were 5,769 fish weighing approximately 54,824 pounds.

## Recreational Fishery in 2011

*Season:* None

*Daily Bag Limit:* Two fish per person

*Allowable Gear Type:* Hook and Line

*Minimum Size:* 28 inches total length

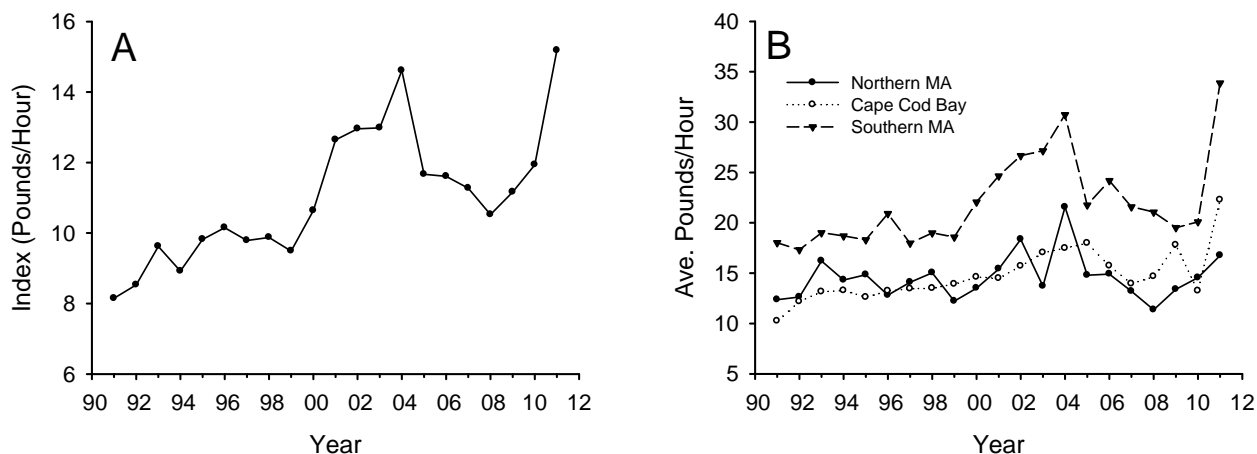
*Licensing and Reporting Requirements:* None

*Harvest levels:* Harvest (A+B1) and total catch (A+B1+B2) estimates (Table 3) were provided by the NMFS MRIP. In 2011, new estimation methods were applied to data collected since 2003, but only small changes (range: -9.1 to 10.1%) were observed for Massachusetts data.

The MRIP estimates of total catch (including fish released alive) in 2011 was 1,228,699 striped bass, which is a 38% decline compared to the 2010 estimate (Table 3). The estimate of total harvest in 2011 was 255,507 fish, which is a decrease in harvest of 25% compared to 2010. Total pounds harvested was over 3.5 million in 2011 (Table 3).

The MRIP estimates were post-stratified by county to determine where harvested bass were being landed by recreational anglers. Most landings (XX%) occurred in Barnstable, Plymouth, Essex, and Bristol counties (Figure 4). Only X% of landings occurred in Dukes, Nantucket, Suffolk and Norfolk counties (Figure 4).

**Figure 3.** A) Harvest index (standardized pounds/hour) and B) average harvest rates by area for the Massachusetts commercial striped bass fishery, 1990-2011.



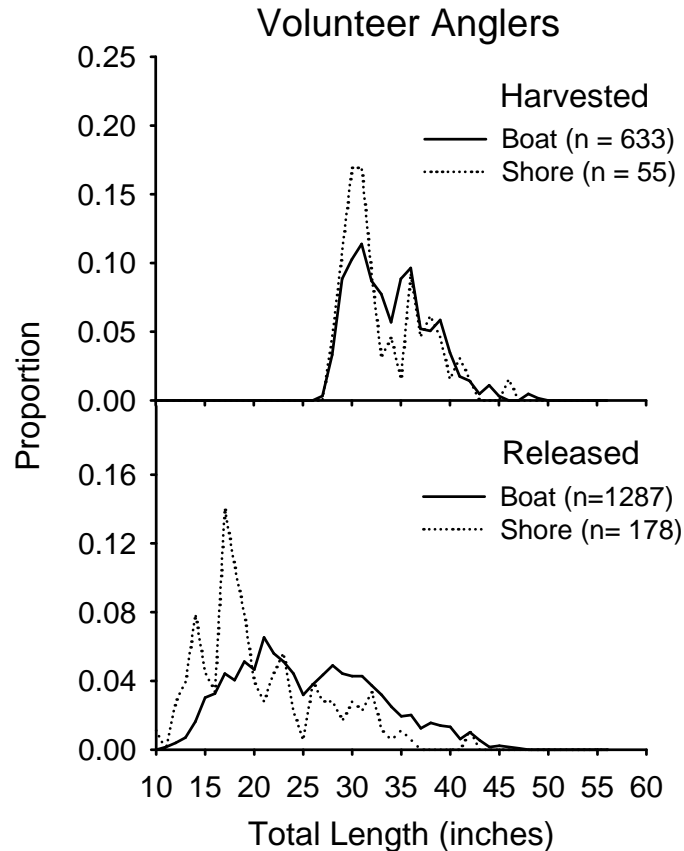
**Table 3.** MRFSS estimates of striped bass harvest, releases, and total catch in Massachusetts.

Year	Harvest (A+B1)		Released (B2)	Total (A+B1+B2)
	Numbers	Weight (lbs)	Numbers	Numbers
1986	29,434	298,816	442,298	471,732
1987	10,807	269,459	93,660	104,467
1988	21,050	421,317	209,632	230,682
1989	13,044	295,227	193,067	206,111
1990	20,515	319,092	339,511	360,026
1991	20,799	440,605	448,735	469,534
1992	57,084	972,116	779,814	836,898
1993	58,511	1,113,446	833,566	892,077
1994	74,538	1,686,049	2,102,514	2,177,052
1995	73,806	1,504,390	3,280,882	3,354,688
1996	68,300	1,291,706	3,269,746	3,338,046
1997	199,373	2,891,970	5,417,751	5,617,124
1998	207,952	2,973,456	7,184,358	7,392,310
1999	126,755	1,822,818	4,576,208	4,702,963
2000	181,295	2,618,216	7,382,031	7,563,326
2001	288,032	3,644,561	5,410,899	5,698,930
2002	308,749	4,304,883	5,718,984	6,027,733
2003	407,100	4,889,035	4,361,710	4,768,810
2004	445,745	6,112,746	4,979,075	5,424,820
2005	340,742	5,097,821	3,988,679	4,329,421
2006	314,988	4,832,355	7,809,777	8,124,765
2007	315,409	5,136,580	5,331,470	5,646,879
2008	377,959	5,763,763	3,649,415	4,027,374
2009	344,401	4,786,895	2,282,601	2,627,002
2010	341,046	4,270,401	1,671,437	2,012,483
2011	255,507	3,504,522	973,192	1,228,699

**Figure 4.** Percentage of total numbers of striped bass harvested by recreational anglers in each county of Massachusetts during 2011.

Not Available Yet

**Figure 5.** Sizes of striped bass caught by volunteer recreational anglers in 2011 by disposition and fishing mode.



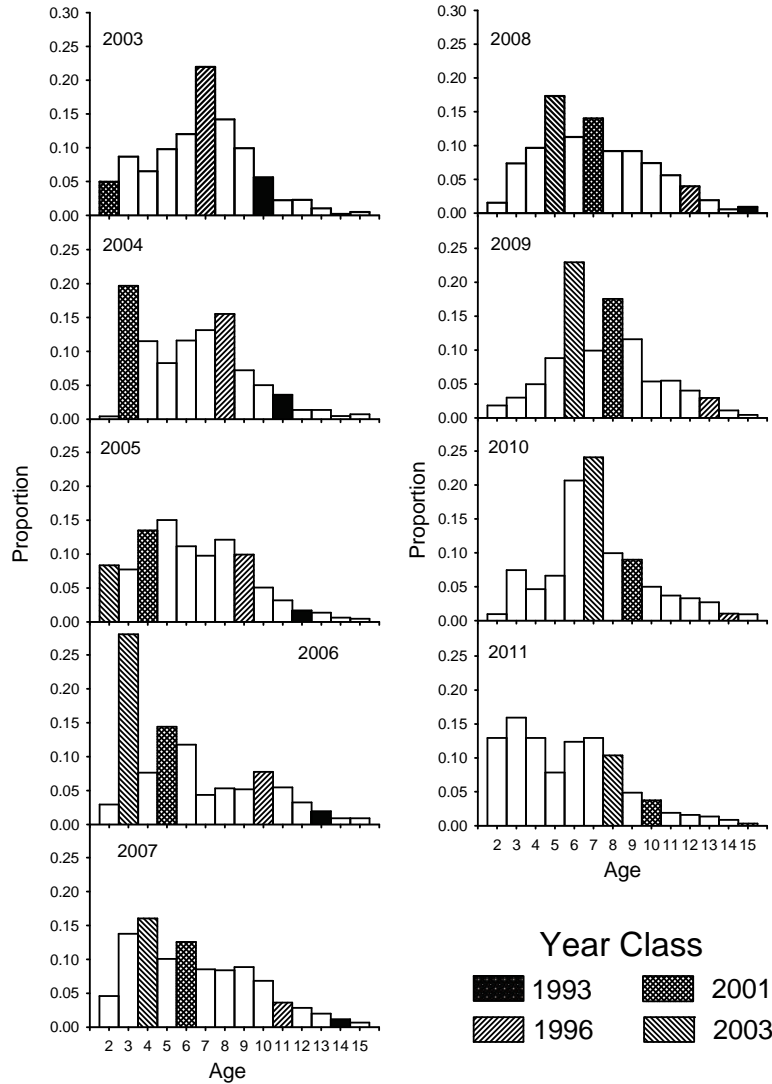
**Size Composition.** The length distributions of harvested and released fish were estimated from biological sampling conducted by the MRIP program in Massachusetts and from a volunteer angler program conducted by the Massachusetts Division of Marine Fisheries. Volunteer recreational anglers were solicited to collect length and scale samples from striped bass that they captured each month (May-October). Each person was asked to collect a minimum of 5 scales from at least 10 fish per month and record the disposition of each fish (released or harvested) and fishing mode. Over 2,160 samples were received from 35 anglers. The size frequencies of measured fish are shown in Figure 5 by disposition and mode. The size frequency of released fishes was used to allocate MRIP release numbers by mode among size classes. Numbers-at-length and weight-at-length data by disposition are summarized in Appendix Tables 3A and 3B.

**Age Composition.** A sub-sample of 567 fish from the volunteer angler survey was aged and combined with commercial and tagging samples to produce an age-length key used to convert the MRIP and MA volunteer angler size distributions into age

classes. Recreational samples were selected using a weighted random design based on the total number of striped bass caught in each wave and mode stratum (as determined by MRIP). Recreational catches of striped bass were comprised mostly of the 2003 and 2004 year-classes. (Figure 6).

**Trends in Catch Rates.** To examine trends in recreational angler catches, standardized catch rates (total number of fish per trip) for striped bass were calculated for all fish caught using a delta-Gamma model (Lo et al., 1992; Stefansson, 1996) which adjusts trip catches for the effects of year, wave, county, area fished, mode fished, and time spent fishing. A delta-Gamma model was selected as the best approach to estimate year effects after examination of model dispersion (Terceiro, 2003) and standardized residual deviance plots (McCullagh and Nelder, 1989). In the delta-Gamma model, catch data is decomposed into catch success/failure and positive catch components. Each component is analyzed separately using appropriate statistical techniques and then the statistical models are recombined to obtain year estimates. The catch success/failure was modeled as a binary response to the categorical variables using multiple logistic

**Figure 6.** Age composition (proportion) of total catches from the Massachusetts recreational fishery.



regression:

$$\text{logit}(p) = \log(p/1-p) = a + \sum_{i=1}^n b_i X_i + e$$

where  $p$  is the probability of catching a fish,  $a$  is the intercept,  $b_i$  is the slope coefficient of the  $i$ th factor,  $X_i$  is the  $i$ th categorical variable, and  $e$  is the error term. The function *glm* in *R* was used to estimate parameters, and goodness-of-fit was assessed using partial and empirical probability plots.

Positive catches were modeled assuming a Gamma error distribution with a log link using function *glm* in *R*

$$y = \exp^{(a + \sum_{i=1}^n b_i X_i)} + e$$

where  $y$  is the observed positive catch,  $b_i$ , and  $X_i$  are

the same symbols as defined earlier, and  $e$  is the Gamma error term. Any variable not significant at  $\alpha=0.05$  dropped from the initial GLM model and the analysis was repeated. First-order interactions were considered in the initial analyses but it was not always possible to generate annual means by the least-square methods with some interactions included (see Searle et al., 1980); therefore, only main effects were considered.

The annual index of striped bass total catch per trip was estimated by combining the two component models. The estimate in year  $i$  from the models is given by

$$\hat{I}_i = \hat{p}_i * \hat{y}_i$$

where  $p_i$  and  $y_i$  are the predicted annual responses

**Table 4.** Estimates of striped bass losses occurring in Massachusetts waters during 2011.

FISHERY	NUMBER	POUNDS	MEAN WT.
<b>Commercial</b>			
Harvest*	64,454	1,235,631	19.2
Release Mortality	5,769	54,824	9.5
<b>Recreational</b>			
Harvest	255,507	3,504,522	13.7
Release Mortality	77,855	511,875	6.6
<b>Total</b>	<b>403,585</b>	<b>5,306,852</b>	

\* includes fish taken for personal consumption

from the least-squares mean estimates from the logistic and GLM models. Only data for those anglers who said they targeted striped bass were used in the analyses.

Results of the delta-Gamma model analyses are given in Appendix Tables 4A and 4B. Standardized catch rates for striped bass in Massachusetts waters increased from 1993 to 1998, declined through 2003, but increased in 2004 and 2005 (Fig. 7). In 2006, catch rates jumped dramatically as the large 2003 year-class became vulnerable to the fishery. Since 2006, catch rates have declined (Fig. 7).

#### Characterization of Losses

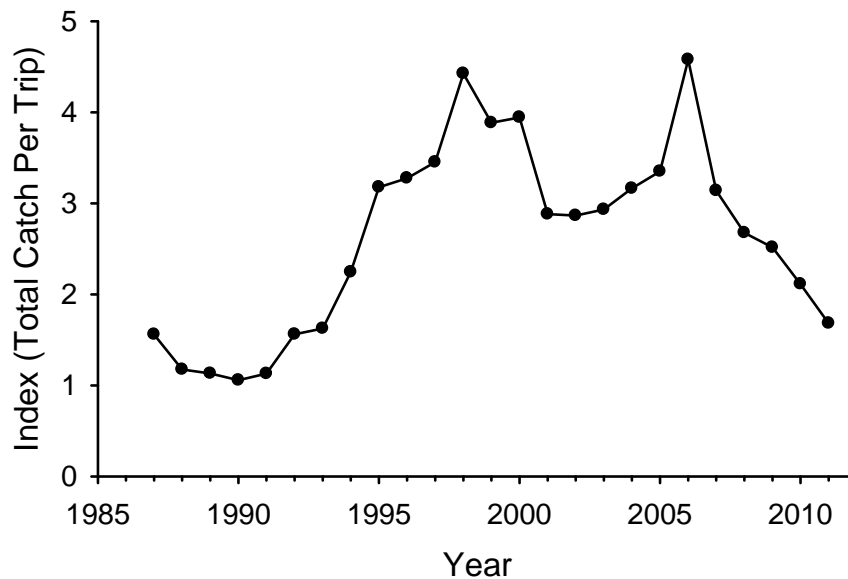
The same methods and rates previously

described in the commercial fishery section were used to estimate recreational losses. Losses due to hook-and-release were 77,855 fish (511,875 pounds) (Table 4).

#### **Bycatch in Other Fisheries**

During 1994, DMF sea-sampling efforts identified striped bass as by-catch in a Nantucket Sound springtime trawl fishery directed at long-finned squid (*Loligo pealei*). The bycatch estimate was about 3,100 fish (17,600 pounds). Anecdotal information was also reported which suggested that a single tow could land up to 19,000 pounds. DMF personnel sampled this fishery at sea during 1995-2000 and observed only incidental catches of

**Figure 7.** Index of total catch rates (total number of fish caught per trip) of the recreational fishery for striped bass in Massachusetts waters, 1987-2011.





**Table 5.** Massachusetts Striped Bass Removals-At-Age Matrix of 2011 By Source.

Age	Recreational		Commercial		Total
	Release Mortality	Harvest	Release Mortality	Harvest*	
2	12,723	0	71	0	12,794
3	15,657	0	176	0	15,832
4	12,508	2,561	393	35	15,497
5	6,547	14,523	652	132	21,854
6	8,590	44,610	1,398	562	55,160
7	8,481	53,023	1,712	5,440	68,656
8	5,978	52,623	1,104	12,472	72,177
9	2,395	29,985	193	13,241	45,813
10	1,721	24,297	47	11,295	37,360
11	931	11,667	18	4,782	17,397
12	872	8,779	2	4,393	14,047
13	761	7,336	1	3,730	11,828
14	526	4,153	0	4,785	9,463
15	104	1,450	0	2,775	4,330
16+	63	500	0	813	1,376

\* includes fish taken for personal consumption

striped bass. Limited sampling and low catch rates make it unreasonable to extrapolate sample information. DMF will continue to monitor potential sources of striped bass by-catch during 2011.

**Estimated Total Losses in 2011**

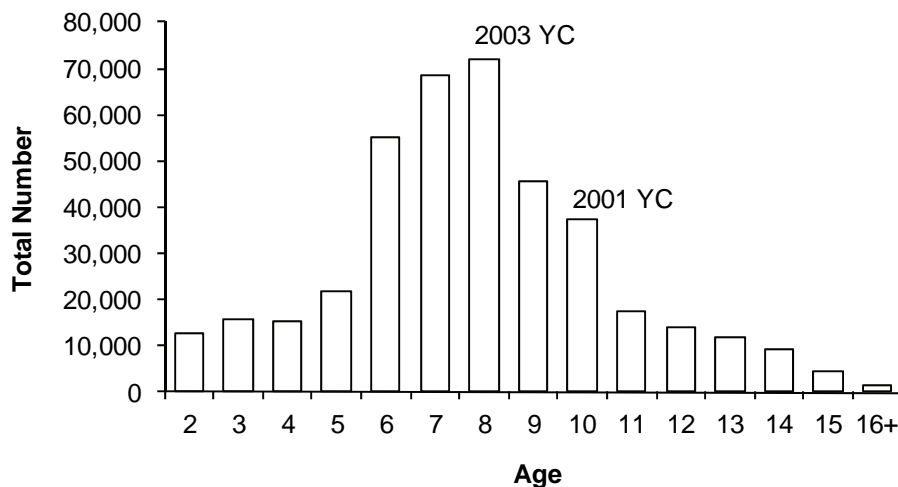
Total estimated loss of striped bass during 2011 was 403,585 fish weighing 5,306,852 pounds (Table 4), which is a 26% decrease in numbers lost and a 17% decrease in weight compared to 2010 (548,664 fish; 6,377,464

pounds). The majority of losses, 83% by number and 76% by weight, was attributed to combined losses in the recreational fishery.

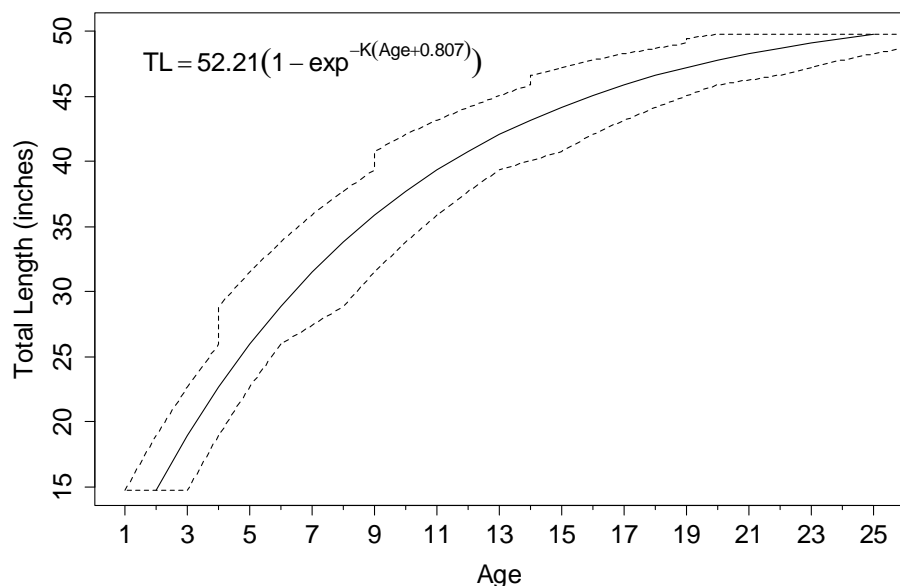
**Removals-At-Age Matrix in 2011**

The removals (numbers) due to release mortality and harvest by the recreational and commercial fisheries are apportioned by age and mortality source in Table 5. The 2003 (age 8), 2004 (age 7) and 2005 (age 6) year-classes incurred the highest losses in 2011 (Figure 8).

**Figure 8.** Total number of striped bass removals in 2011 by age. The 2003 and 2001 year-classes are indicated.



**Figure 9.** Mean length-age relationship (solid line) for striped bass captured in Massachusetts. Dotted lines represent the minimum and maximum ages found at a given length.



### Age-Length Relationship

A von Bertalanffy growth model was fitted to age (years) and total length (inches) data from samples collected in the tagging study, the recreational fishery, and commercial fishery from 2004-2011. The resulting equation and predicted relationship are shown in Figure 9.

### Required Fishery-Independent Monitoring Programs

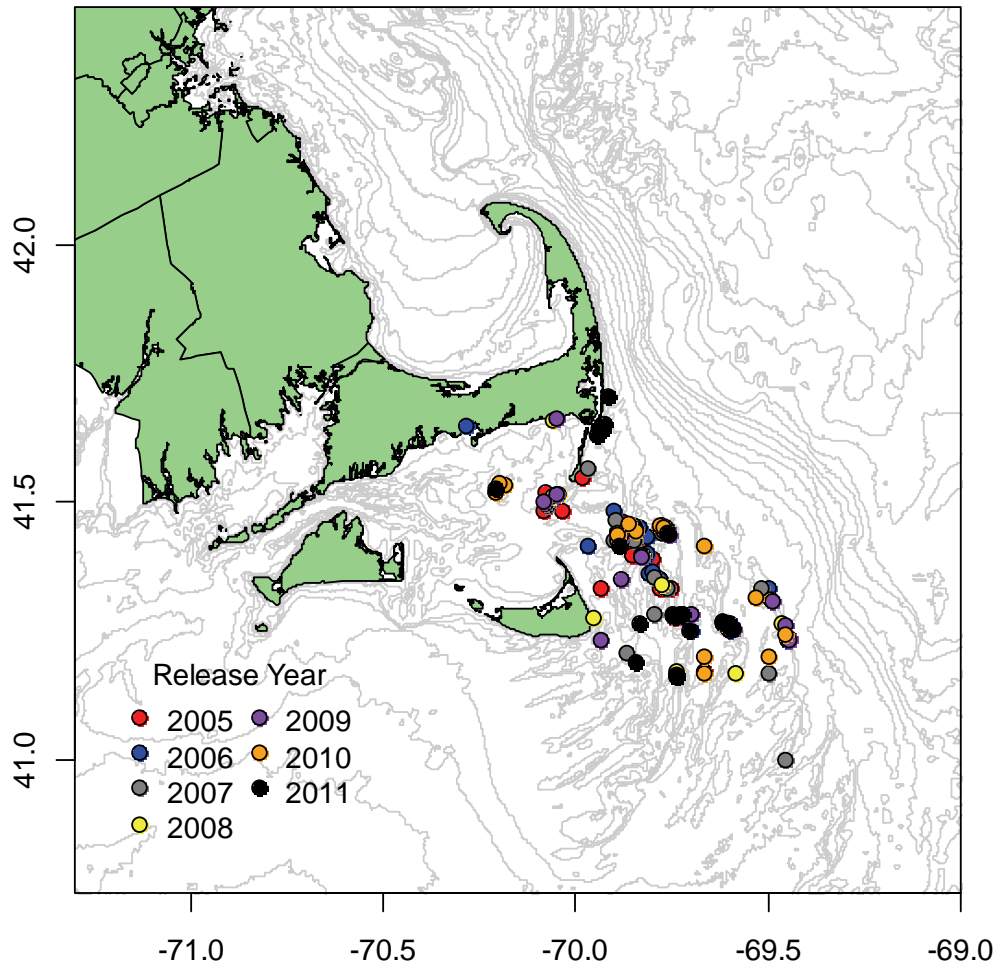
### Massachusetts Tagging Study

The Massachusetts Division of Marine Fisheries (DMF) joined the Striped Bass Cooperative State-Federal Coast-wide Tagging Study in 1991. The study's primary objective has been to develop an integrated database of tag releases and recoveries that will provide current information related to striped bass mortality and migration rates. The Massachusetts tagging effort has focused on the tag and release of large fish that reach coast-wide legal

**Table 6.** Massachusetts tag summary statistics. SD = standard deviation.

Year	Trips	Boats	Number Tagged	Ave. Length (mm)	Ave. Length (in)	SD (mm)	SD (in)	Length Range			
								Min (mm)	Min (in)	Max (mm)	Max (in)
1991	17	4	388	817	32.2	106.4	4.2	534	21.0	1300	51.2
1992	29	3	899	798	31.4	125.9	5.0	524	20.6	1267	49.9
1993	15	2	678	784	30.9	125.0	4.9	515	20.3	1210	47.6
1994	13	2	377	735	28.9	93.2	3.7	548	21.6	1028	40.5
1995	11	2	449	767	30.2	110.2	4.3	470	18.5	1178	46.4
1996	8	2	203	748	29.4	64.1	2.5	541	21.3	1077	42.4
1997	10	2	321	773	30.4	114.7	4.5	485	19.1	1090	42.9
1998	12	2	382	797	31.4	93.8	3.7	597	23.5	1055	41.5
1999	16	2	471	777	30.6	95.5	3.8	594	23.4	1108	43.6
2000	25	4	1095	752	29.6	102.6	4.0	510	20.1	1204	47.4
2001	14	3	456	786	30.9	102.5	4.0	503	19.8	1110	43.7
2002	12	3	239	764	30.1	103.6	4.1	487	19.2	1060	41.7
2003	15	3	655	825	32.5	92.1	3.6	602	23.7	1204	47.4
2004	25	7	784	707	27.8	193.1	7.6	316	12.4	1164	45.8
2005	19	4	752	726	28.6	210.5	8.3	299	11.8	1114	43.9
2006	11	4	390	813	32.0	94.2	3.7	565	22.2	1114	43.9
2007	16	3	530	848	33.4	105.2	4.1	600	23.6	1225	48.2
2008	13	2	456	821	32.3	104.6	4.1	530	20.9	1202	47.3
2009	15	3	501	840	33.1	101.8	4.0	572	22.5	1146	45.1
2010	13	3	329	825	32.5	84.0	3.3	668	26.3	1095	43.1
2011	15	3	504	831	32.7	91.9	3.6	580	22.8	1174	46.2

**Figure 10.** Map of DMF fall tagging locations during 2005-2011.



sizes. To accomplish this job, the DMF contracts several select charter boat captains to take DMF personnel on board to tag and release their catch during regularly scheduled fishing trips. Fish are caught in fall by trolling artificial baits in shoal areas around Nantucket Island (Figure 10). Floy internal anchor tags provided by the USFWS are used. Total length of each fish is recorded. Scales are removed from each fish for aging. The release data are made available to the Annapolis, Maryland office of the USFWS, which coordinates regional tagging programs of state-federal participants.

Summary statistics compiled since the start of this study are shown in Table 6. Striped bass released in 2005-2010 were recaptured from mainly coastal waters in North Carolina through New Hampshire (Figure 11).

#### **Planned Management Programs in 2011**

#### Regulations

Massachusetts' recreational bag and minimum size limits will remain at 2 fish per day and 28-inches total length, respectively. For the commercial fishery, minimum size limit will remain at 34-inches and the quota will be reduced from 1,159,750 pounds to 1,057,783 pounds due to overharvest in 2011. The commercial fishery quota will be monitored using the SAFIS system. The commercial season will not open until July 12 and harvesting will be allowed only on Sunday with a daily bag limit of 5 fish, and Tuesday-Thursday with a daily bag limit of 30 fish.

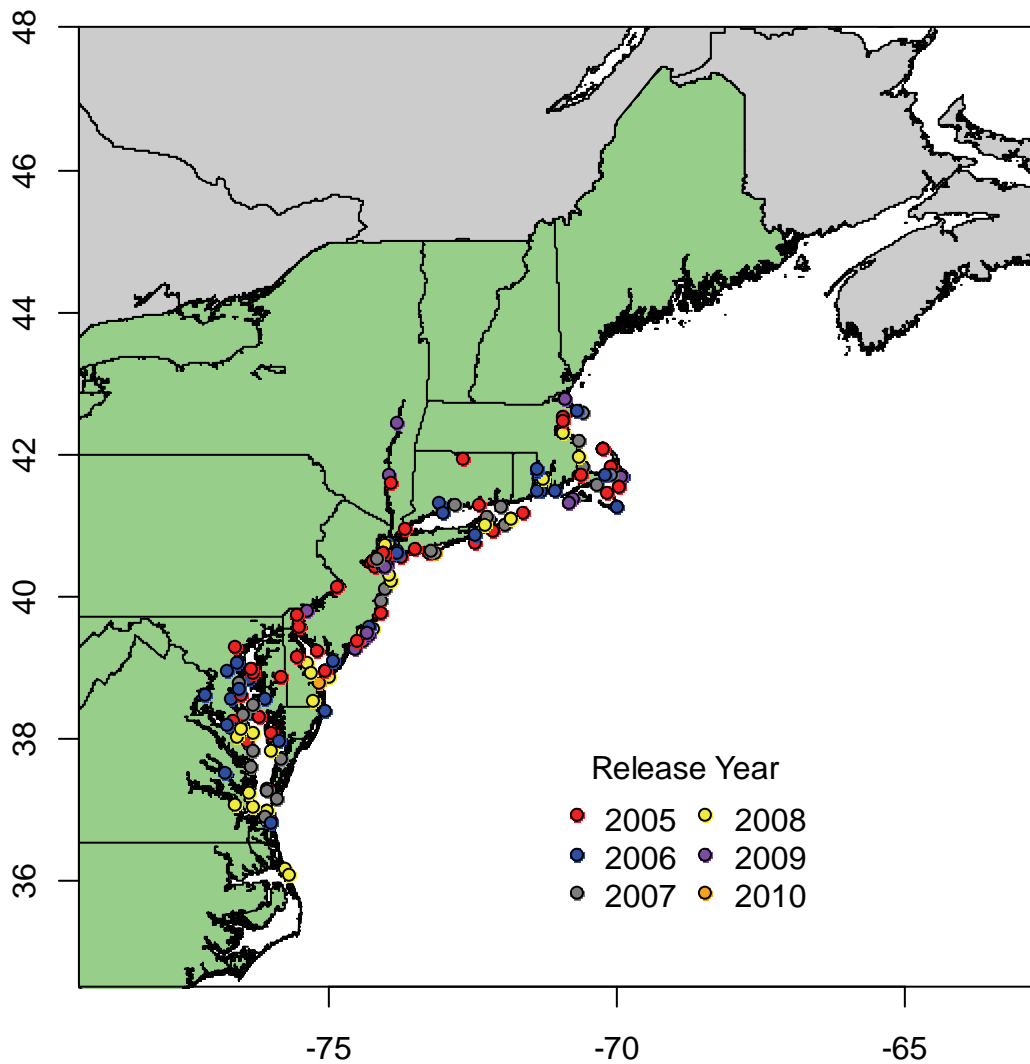
#### Monitoring Programs

All monitoring programs will continue in 2011.

#### **Acknowledgements**

The collection and quality of striped bass data would suffer greatly without the efforts of many

**Figure 11.** Map of recovery locations of DMF tagged striped bass by release year, 2005-2010.



DMF employees. Staff of the Fisheries Statistics section collected, entered, and compiled all commercial data. Jennifer Stritzel-Thomson coordinated the volunteer recreational angler data collection program, entered scale envelope data, and prepared data for analysis. John Boardman aged all scale samples. John Boardman, Nick Buchan, and Brad Schondelmeier conducted the commercial sampling of stripers. Paul Caruso and John Boardman also coordinated and conducted the USFWS cooperative tagging study. Funding for this effort was provided by the Massachusetts Division of Marine Fisheries and Sportfish Restoration Funds Grants F-57-R and F-48-R.

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**Appendix Table 1A.** Estimated size distribution of the Massachusetts commercial striped bass catch (numbers of fish) in 2011.

TL (in.)	Harvested*	Released	Total	Percent	Cumulative Percent
11	0	0	0	0.00	0.00
12	0	0	0	0.00	0.00
13	0	0	0	0.00	0.00
14	0	157	157	0.11	0.11
15	0	52	52	0.04	0.15
16	0	418	418	0.31	0.46
17	0	627	627	0.46	0.92
18	0	313	313	0.23	1.15
19	0	522	522	0.38	1.53
20	0	888	888	0.65	2.18
21	0	313	313	0.23	2.41
22	0	835	835	0.61	3.02
23	0	418	418	0.31	3.33
24	0	3,185	3,185	2.33	5.66
25	0	1,671	1,671	1.22	6.88
26	0	2,820	2,820	2.06	8.95
27	0	4,125	4,125	3.02	11.97
28	162	7,467	7,629	5.59	17.55
29	296	5,274	5,570	4.08	21.63
30	350	9,451	9,801	7.18	28.81
31	323	8,981	9,305	6.81	35.62
32	2,743	14,464	17,207	12.60	48.22
33	4,552	7,728	12,280	8.99	57.22
34	10,996	1,462	12,458	9.12	66.34
35	5,506	52	5,559	4.07	70.41
36	4,478	835	5,314	3.89	74.30
37	6,650	0	6,650	4.87	79.17
38	5,406	52	5,458	4.00	83.16
39	5,774	0	5,774	4.23	87.39
40	4,012	0	4,012	2.94	90.33
41	2,742	0	2,742	2.01	92.34
42	3,680	0	3,680	2.69	95.03
43	2,727	0	2,727	2.00	97.03
44	1,878	0	1,878	1.38	98.40
45	1,708	0	1,708	1.25	99.66
46	171	0	171	0.13	99.78
47	68	0	68	0.05	99.83
48	164	0	164	0.12	99.95
49	34	0	34	0.02	99.98
50	34	0	34	0.02	100.00
51	0	0	0	0.00	100.00
52	0	0	0	0.00	100.00
Total	64,454	72,110	136,564		
Avg. Size	37.3	29.4	33.1		

\* includes fish taken for personal consumption

**Appendix Table 1B.** Estimated weight distribution by size of the Massachusetts commercial striped bass catch (pounds) in 2011.

TL (in.)	Harvested*	Released	Total	Percent	Cumulative Percent
11	0	0	0	0.00	0.00
12	0	0	0	0.00	0.00
13	0	0	0	0.00	0.00
14	0	153	153	0.01	0.01
15	0	63	63	0.00	0.01
16	0	611	611	0.03	0.04
17	0	1,100	1100	0.06	0.10
18	0	653	653	0.03	0.13
19	0	1,281	1281	0.07	0.20
20	0	2,541	2541	0.13	0.33
21	0	1,039	1039	0.05	0.39
22	0	3,186	3186	0.17	0.55
23	0	1,821	1821	0.09	0.65
24	0	15,777	15777	0.82	1.47
25	0	9,357	9357	0.49	1.96
26	0	17,767	17767	0.93	2.88
27	0	29,116	29116	1.52	4.40
28	1,273	58,794	60067	3.13	7.53
29	2,594	46,147	48741	2.54	10.07
30	3,394	91,575	94970	4.95	15.02
31	3,458	96,039	99497	5.18	20.21
32	32,271	170,161	202432	10.55	30.75
33	58,748	99,731	158478	8.26	39.01
34	155,239	20,640	175879	9.17	48.18
35	84,814	804	85619	4.46	52.64
36	75,074	14,006	89080	4.64	57.28
37	121,052	0	121052	6.31	63.59
38	106,621	1,030	107651	5.61	69.20
39	123,132	0	123132	6.42	75.61
40	92,327	0	92327	4.81	80.43
41	67,963	0	67963	3.54	83.97
42	98,069	0	98069	5.11	89.08
43	77,998	0	77998	4.06	93.14
44	57,559	0	57559	3.00	96.14
45	56,010	0	56010	2.92	99.06
46	5,991	0	5991	0.31	99.37
47	2,542	0	2542	0.13	99.50
48	6,530	0	6530	0.34	99.85
49	1,440	0	1440	0.08	99.92
50	1,531	0	1531	0.08	100.00
51	0	0	0	0.00	100.00
52	0	0	0	0.00	100.00
Total	1,235,631	683,394	1,919,025		
Avg. Weight	19.2	9.5	14.1		

\* includes fish taken for personal consumption

**Appendix Table 2.** Results of the GLM analyses of total catch rates (pounds/hour) for the commercial striped bass fishery., 1991-2011

ANOVA Table (TYPE III)

Response: log(pounds/hour)

	SS	Df	F	Pr(>F)
YEAR	647.7	20	33.827	2.20E-16
AREA	928.7	2	485.019	2.20E-16
Residuals	27494	28717		

Coefficients:

	Estimate	SE	t	Pr(> t )	
(Intercept)	1.974655	0.033	60.51	2.00E-16	***
YEAR1992	0.045426	0.043	1.048	0.294615	
YEAR1993	0.165957	0.043	3.861	0.000113	***
YEAR1994	0.090327	0.042	2.165	0.030367	*
YEAR1995	0.186387	0.039	4.837	1.32E-06	***
YEAR1996	0.219782	0.063	3.482	0.000498	***
YEAR1997	0.183253	0.038	4.885	1.04E-06	***
YEAR1998	0.191997	0.038	5.073	3.94E-07	***
YEAR1999	0.15233	0.039	3.92	8.87E-05	***
YEAR2000	0.266107	0.04	6.687	2.31E-11	***
YEAR2001	0.439221	0.04	10.96	2.00E-16	***
YEAR2002	0.463536	0.039	11.77	2.00E-16	***
YEAR2003	0.465613	0.038	12.19	2.00E-16	***
YEAR2004	0.583514	0.043	13.44	2.00E-16	***
YEAR2005	0.358591	0.039	9.166	2.00E-16	***
YEAR2006	0.353737	0.039	9.089	2.00E-16	***
YEAR2007	0.324272	0.04	8.151	3.76E-16	***
YEAR2008	0.255636	0.04	6.469	9.99E-11	***
YEAR2009	0.314688	0.039	8.022	1.08E-15	***
YEAR2010	0.381443	0.041	9.403	2.00E-16	***
YEAR2011	0.621957	0.044	14	2.00E-16	***
AREACCB	0.005527	0.017	0.332	0.739847	
AREASMA	0.364511	0.015	24.36	2.00E-16	***

Year	lsmeans
1991	8.14986
1992	8.528618
1993	9.621089
1994	8.920285
1995	9.819674
1996	10.15314
1997	9.788942
1998	9.874915
1999	9.490875
2000	10.63455
2001	12.64449
2002	12.95572
2003	12.98264
2004	14.60721
2005	11.66499
2006	11.6085
2007	11.27145
2008	10.52377
2009	11.16394
2010	11.93462
2011	15.17968



**Appendix Table 3A.** Estimated size distribution of the Massachusetts recreational striped bass catch (numbers of fish) in 2011.

TL (in.)	Harvested	Released	Total	Percent	Cumulative Percent
9	0	0	0	0.00	0.00
10	0	3,199	3,199	0.26	0.26
11	0	1,479	1,479	0.12	0.38
12	0	11,165	11,165	0.91	1.29
13	0	15,729	15,729	1.28	2.57
14	0	34,740	34,740	2.83	5.40
15	0	33,480	33,480	2.72	8.12
16	0	24,546	24,546	2.00	10.12
17	0	64,770	64,770	5.27	15.39
18	0	53,861	53,861	4.38	19.77
19	0	55,091	55,091	4.48	24.26
20	0	42,241	42,241	3.44	27.70
21	0	53,008	53,008	4.31	32.01
22	0	48,338	48,338	3.93	35.94
23	0	46,833	46,833	3.81	39.76
24	0	34,029	34,029	2.77	42.53
25	0	23,963	23,963	1.95	44.48
26	0	38,680	38,680	3.15	47.62
27	7,682	41,384	49,066	3.99	51.62
28	5,781	47,422	53,204	4.33	55.95
29	30,081	37,730	67,811	5.52	61.47
30	23,756	41,307	65,064	5.30	66.76
31	35,531	38,714	74,245	6.04	72.80
32	24,470	38,059	62,529	5.09	77.89
33	19,098	27,614	46,712	3.80	81.69
34	11,169	18,697	29,866	2.43	84.13
35	12,768	18,169	30,937	2.52	86.64
36	23,206	16,846	40,052	3.26	89.90
37	11,733	8,914	20,647	1.68	91.58
38	18,361	11,407	29,769	2.42	94.01
39	10,009	9,664	19,673	1.60	95.61
40	8,030	9,918	17,948	1.46	97.07
41	4,452	3,728	8,180	0.67	97.73
42	3,457	10,557	14,014	1.14	98.87
43	1,055	3,320	4,375	0.36	99.23
44	2,462	1,280	3,742	0.30	99.54
45	704	1,821	2,524	0.21	99.74
46	291	750	1,041	0.08	99.83
47	0	740	740	0.06	99.89
48	1,055	0	1,055	0.09	99.97
49	352	0	352	0.03	100.00
50	0	0	0	0.00	100.00
51	0	0	0	0.00	100.00
52	0	0	0	0.00	100.00
53	0	0	0	0.00	100.00
54	0	0	0	0.00	100.00
55	0	0	0	0.00	100.00
56	0	0	0	0.00	100.00
Total	255,507	973,192	1,228,699		
Avg. Size	33.5	24.5	26.4		

**Appendix Table 3B.** Estimated size distribution of the Massachusetts recreational striped bass catch (pounds) in 2011.

TL (in.)	Harvested	Released	Total	Percent	Cumulative Percent
9	0	0	0		
10	0	1,103	1,103	0.01	0.01
11	0	679	679	0.01	0.02
12	0	6,662	6,662	0.07	0.09
13	0	11,939	11,939	0.12	0.21
14	0	32,950	32,950	0.33	0.54
15	0	39,076	39,076	0.39	0.93
16	0	34,786	34,786	0.35	1.28
17	0	110,143	110,143	1.11	2.40
18	0	108,768	108,768	1.10	3.49
19	0	130,893	130,893	1.32	4.82
20	0	117,100	117,100	1.18	6.00
21	0	170,169	170,169	1.72	7.72
22	0	178,476	178,476	1.80	9.52
23	0	197,648	197,648	2.00	11.52
24	0	163,220	163,220	1.65	13.16
25	0	129,948	129,948	1.31	14.48
26	0	236,014	236,014	2.38	16.86
27	52,445	282,860	335,305	3.39	20.25
28	44,031	361,587	405,618	4.10	24.34
29	254,595	319,703	574,298	5.80	30.14
30	222,644	387,575	610,219	6.16	36.30
31	367,497	400,885	768,382	7.76	44.06
32	278,452	433,575	712,027	7.19	51.25
33	238,393	345,084	583,477	5.89	57.14
34	152,516	255,590	408,106	4.12	61.26
35	190,224	271,001	461,225	4.66	65.92
36	376,296	273,478	649,775	6.56	72.48
37	206,592	157,145	363,737	3.67	76.16
38	350,300	217,883	568,183	5.74	81.89
39	206,473	199,579	406,052	4.10	85.99
40	178,749	221,031	399,781	4.04	90.03
41	106,746	89,486	196,231	1.98	92.01
42	89,120	272,437	361,557	3.65	95.66
43	29,197	91,954	121,151	1.22	96.89
44	73,001	37,994	110,996	1.12	98.01
45	22,316	57,813	80,129	0.81	98.82
46	9,877	25,432	35,309	0.36	99.17
47	0	26,769	26,769	0.27	99.44
48	40,643	0	40,643	0.41	99.85
49	14,414	0	14,414	0.15	100.00
50	0	0	0	0.00	100.00
51	0	0	0	0.00	100.00
52	0	0	0	0.00	100.00
53	0	0	0	0.00	100.00
54	0	0	0	0.00	100.00
55	0	0	0	0.00	100.00
56	0	0	0	0.00	100.00
Total	3,504,522	6,398,434	9,902,956		
Avg. Weight	13.7	6.6	8.1		

**Appendix 4A.** Results of the Gamma regression analysis of MRFSS striped bass catch positive catches.

Anova Table (Type III)

Response:	TOT_FISH	Chisq	Df	Pr(>Chisq)	
YEAR		396.9	24	2.20E-16	***
AREA_X		38.87	2	3.62E-09	***
MODE_FX		438.68	2	2.20E-16	***
WAVE		285.46	2	2.20E-16	***
CNTY		122.21	7	2.20E-16	***
FFDAYS12C		583.96	12	2.20E-16	***
HOURS		996.11	11	2.20E-16	***

Coefficients:

	Estimate	SE	t	Pr(> t )
(Intercept)	0.310836	0.23	1.346	0.1784
YEAR1988	-0.18701	0.26	-0.733	0.4635
YEAR1989	-0.25296	0.25	-1.017	0.3091
YEAR1990	-0.24759	0.24	-1.033	0.3016
YEAR1991	-0.10989	0.24	-0.459	0.6459
YEAR1992	0.099214	0.23	0.427	0.6695
YEAR1993	-0.05934	0.23	-0.256	0.7977
YEAR1994	0.011011	0.23	0.048	0.9617
YEAR1995	0.234839	0.23	1.029	0.3037
YEAR1996	0.248867	0.23	1.089	0.2763
YEAR1997	0.308673	0.23	1.353	0.1760
YEAR1998	0.396061	0.23	1.74	0.0819 .
YEAR1999	0.341672	0.23	1.499	0.1339
YEAR2000	0.38405	0.23	1.682	0.0926 .
YEAR2001	0.144812	0.23	0.635	0.5256
YEAR2002	0.121912	0.23	0.533	0.5939
YEAR2003	0.188598	0.23	0.825	0.4094
YEAR2004	0.235133	0.23	1.026	0.3050
YEAR2005	0.249698	0.23	1.088	0.2765
YEAR2006	0.47737	0.23	2.088	0.0368 *
YEAR2007	0.212656	0.23	0.928	0.3534
YEAR2008	0.119693	0.23	0.519	0.6035
YEAR2009	0.076974	0.23	0.335	0.7379
YEAR2010	0.014504	0.23	0.063	0.9500
YEAR2011	-0.14819	0.23	-0.638	0.5233
AREA_X2	-0.04989	0.03	-1.918	0.0552 .
AREA_X5	0.088647	0.02	4.76	1.95E-06 ***
MODE_FX6	0.356715	0.04	10.174	2.00E-16 ***
MODE_FX7	0.504551	0.02	21.833	2.00E-16 ***
WAVE4	-0.30408	0.02	-16.868	2.00E-16 ***
WAVE5	-0.1809	0.02	-8.085	6.55E-16 ***
CNTY5	-0.14173	0.04	-3.625	0.00029 ***
CNTY7	-0.2966	0.05	-6.045	1.52E-09 ***
CNTY9	0.100331	0.02	4.842	1.30E-06 ***
CNTY19	-0.10528	0.07	-1.478	0.13935
CNTY21	-0.00019	0.04	-0.004	0.99644
CNTY23	-0.02383	0.03	-0.885	0.37604
CNTY25	-0.33941	0.06	-5.382	7.46E-08 ***

Appendix 4A cont'd.

Coefficients:

	Estimate	SE	t	Pr(> t )
FFDAYS12C10	0.057562	0.03	2.249	0.02449 *
FFDAYS12C20	0.178966	0.03	6.913	4.86E-12 ***
FFDAYS12C30	0.178405	0.03	5.951	2.71E-09 ***
FFDAYS12C40	0.325176	0.04	8.88	2.00E-16 ***
FFDAYS12C50	0.368813	0.03	11.523	2.00E-16 ***
FFDAYS12C60	0.416569	0.04	9.502	2.00E-16 ***
FFDAYS12C70	0.43873	0.05	8.058	8.17E-16 ***
FFDAYS12C80	0.479514	0.08	6.356	2.11E-10 ***
FFDAYS12C90	0.537219	0.09	6.183	6.39E-10 ***
FFDAYS12C100	0.557673	0.03	16.269	2.00E-16 ***
FFDAYS12C150	0.61556	0.06	10.398	2.00E-16 ***
FFDAYS12C200	0.716863	0.07	10.326	2.00E-16 ***
HOURS2	0.10434	0.05	2.13	0.03315 *
HOURS3	0.332073	0.05	7.163	8.12E-13 ***
HOURS4	0.471311	0.05	10.321	2.00E-16 ***
HOURS5	0.627422	0.05	13.455	2.00E-16 ***
HOURS6	0.684968	0.05	14.535	2.00E-16 ***
HOURS7	0.898316	0.05	17.456	2.00E-16 ***
HOURS8	0.899721	0.05	16.566	2.00E-16 ***
HOURS9	0.921528	0.07	12.514	2.00E-16 ***
HOURS10	1.064556	0.08	12.695	2.00E-16 ***
HOURS11	1.274576	0.17	7.359	1.92E-13 ***
HOURS12	1.047941	0.1	10.381	2.00E-16 ***

Year	lsmeans
1987	4.124
1988	3.421
1989	3.203
1990	3.220
1991	3.695
1992	4.555
1993	3.887
1994	4.170
1995	5.216
1996	5.290
1997	5.616
1998	6.129
1999	5.804
2000	6.056
2001	4.767
2002	4.659
2003	4.981
2004	5.218
2005	5.294
2006	6.648
2007	5.102
2008	4.649
2009	4.454
2010	4.185
2011	3.556

**Appendix Table 4B.** Results of the logistic regression analysis of MRFSS striped bass success/failure.

Anova Table (Type III)

Response: 0/1

	Chisq	Df	Pr(>Chisq)	
YEAR	1796.4	24	2.20E-16	***
AREA_X	208.5	2	2.20E-16	***
MODE_FX	4153.8	2	2.20E-16	***
WAVE	403.5	2	2.20E-16	***
CNTY	420.3	7	2.20E-16	***
FFDAYS12C	976.8	12	2.20E-16	***
HOURS	2859.1	11	2.20E-16	***

Coefficients:

	Estimate	SE	Z	Pr(> z )	
(Intercept)	-3.72	0.25092	-14.825	2.00E-16	***
YEAR1988	-0.1504	0.27318	-0.55	0.582016	
YEAR1989	-0.1071	0.27014	-0.397	0.691688	
YEAR1990	-0.2173	0.25912	-0.838	0.401761	
YEAR1991	-0.3219	0.25787	-1.248	0.211875	
YEAR1992	-0.1517	0.25216	-0.601	0.547567	
YEAR1993	0.16743	0.25135	0.666	0.505343	
YEAR1994	0.65303	0.24943	2.618	0.008842	**
YEAR1995	0.94284	0.24873	3.791	0.00015	***
YEAR1996	0.98525	0.24916	3.954	7.68E-05	***
YEAR1997	0.96559	0.24844	3.887	0.000102	***
YEAR1998	1.4528	0.24839	5.849	4.95E-09	***
YEAR1999	1.20279	0.24849	4.84	1.30E-06	***
YEAR2000	1.12264	0.249	4.509	6.53E-06	***
YEAR2001	0.9222	0.24848	3.711	0.000206	***
YEAR2002	0.9674	0.24936	3.88	0.000105	***
YEAR2003	0.85708	0.24905	3.441	0.000579	***
YEAR2004	0.93116	0.25048	3.718	0.000201	***
YEAR2005	1.04382	0.25092	4.16	3.18E-05	***
YEAR2006	1.29284	0.24986	5.174	2.29E-07	***
YEAR2007	0.96888	0.2507	3.865	0.000111	***
YEAR2008	0.80319	0.25187	3.189	0.001428	**
YEAR2009	0.75875	0.25093	3.024	0.002497	**
YEAR2010	0.51804	0.25246	2.052	0.040174	*
YEAR2011	0.38934	0.253	1.539	0.123827	
AREA_X2	-0.0365	0.03364	-1.084	0.278272	
AREA_X5	0.30139	0.02302	13.091	2.00E-16	***
MODE_FX6	2.65579	0.04775	55.622	2.00E-16	***
MODE_FX7	1.16216	0.02556	45.471	2.00E-16	***
WAVE4	-0.3661	0.02349	-15.584	2.00E-16	***
WAVE5	-0.5179	0.02763	-18.747	2.00E-16	***
CNTY5	-0.2585	0.04765	-5.425	5.80E-08	***
CNTY7	-0.1553	0.05911	-2.627	0.008618	**
CNTY9	0.37036	0.0254	14.583	2.00E-16	***
CNTY19	-0.3947	0.08288	-4.762	1.92E-06	***
CNTY21	0.12258	0.05331	2.299	0.021484	*
CNTY23	-0.1161	0.0323	-3.595	0.000325	***
CNTY25	0.11317	0.07681	1.473	0.140651	

**Appendix Table 4B cont'd.**

Coefficients:

	Estimate	SE	Z	Pr(> z )
FFDAYS12C1	0.13735	0.03075	4.467	7.93E-06 ***
FFDAYS12C2	0.40299	0.03193	12.622	2.00E-16 ***
FFDAYS12C3	0.49168	0.03747	13.12	2.00E-16 ***
FFDAYS12C4	0.58443	0.04696	12.444	2.00E-16 ***
FFDAYS12C5	0.73676	0.04154	17.736	2.00E-16 ***
FFDAYS12C6	0.6883	0.05654	12.175	2.00E-16 ***
FFDAYS12C7	0.82814	0.07247	11.428	2.00E-16 ***
FFDAYS12C8	0.86549	0.10254	8.44	2.00E-16 ***
FFDAYS12C9	0.66128	0.11061	5.978	2.25E-09 ***
FFDAYS12C10	0.91623	0.04538	20.19	2.00E-16 ***
FFDAYS12C11	0.95088	0.07778	12.225	2.00E-16 ***
FFDAYS12C2	0.90118	0.08963	10.054	2.00E-16 ***
HOURS2	0.66125	0.04905	13.48	2.00E-16 ***
HOURS3	1.05954	0.04699	22.55	2.00E-16 ***
HOURS4	1.37227	0.04672	29.374	2.00E-16 ***
HOURS5	1.53838	0.04872	31.576	2.00E-16 ***
HOURS6	1.79159	0.05059	35.414	2.00E-16 ***
HOURS7	1.99568	0.06068	32.889	2.00E-16 ***
HOURS8	1.91584	0.06418	29.853	2.00E-16 ***
HOURS9	2.22326	0.10135	21.937	2.00E-16 ***
HOURS10	2.27352	0.11669	19.484	2.00E-16 ***
HOURS11	1.67471	0.2263	7.4	1.36E-13 ***
HOURS12	2.3006	0.13918	16.53	2.00E-16 ***

Year	lsmeans
1987	0.37795
1988	0.3433
1989	0.35312
1990	0.32838
1991	0.30573
1992	0.34301
1993	0.41804
1994	0.53862
1995	0.60935
1996	0.6194
1997	0.61476
1998	0.72203
1999	0.66919
2000	0.65122
2001	0.60443
2002	0.61518
2003	0.58876
2004	0.60657
2005	0.63311
2006	0.68882
2007	0.61553
2008	0.57565
2009	0.56476
2010	0.50495
2011	0.4728





STATE OF RHODE ISLAND  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF FISH & WILDLIFE  
**MARINE FISHERIES SECTION**

Fort Wetherill Marine Laboratory  
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Jamestown, RI 02835

PH: 401.423.1920  
FAX: 401.423.1925

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TO: Kate Taylor, FMP Coordinator  
Atlantic States Marine Fisheries Commission

FROM: Nicole Trivisono, Rhode Island Marine Fisheries

DATE: 13 July 2012

SUBJECT: Rhode Island Annual Compliance Report for Atlantic Striped Bass

Please find Rhode Island's annual compliance report for striped bass attached to this memo. If you have any questions, you may contact me directly at 401.423.1940.

cc: M. Gibson  
A. Valliere

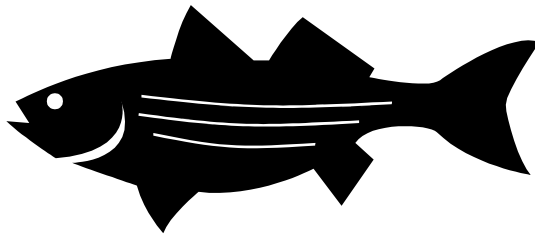
attachment



Annual Compliance Report  
to the  
Atlantic States Marine Fisheries Commission

**Striped Bass Fisheries and Management  
in  
Rhode Island**

**Review of 2011**



Prepared by:  
Nicole Trivisono  
RI Marine Fisheries  
June 2012

## ATLANTIC STRIPED BASS

### I. Introduction

The striped bass has historically been one of the most important recreational and commercial fishery species in Rhode Island. The commercial fishery for striped bass is allocated an annual quota, which is divided between the rod and reel and floating fish trap gears. In 2011, the commercial rod and reel or General Category fishery landed 134,299 lb of striped bass, while commercial floating fish traps landings totaled 93,864 lb. The Rhode Island total catch by recreational anglers was 1,257,302 lb (MRIP) of striped bass in 2011 more than five times the weight of total landings for the commercial fishery. Recreational harvest of striped bass in Rhode Island increased from 70,108 (MRIP) fish in 2010 to 88,635 (MRIP) fish in 2011. As of 2011, all RI-licensed seafood dealers and commercial harvesters are required to report trip-level data. See below for a comparison of MRFSS vs. MRIP numbers for recreational catch and effort data.

Source	Harvest Numbers	Harvest Weight (lbs)	Released Numbers
MRFSS	100,994	1,106,597	198,815
MRIP	88,635	1,257,302	214,302

### II. Request for *de minimis*, where applicable

The state of Rhode Island does not wish to apply for *de minimis* status.

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

A. Harvest and losses (refer to Table 9 in Amendment 6 to the Atlantic Striped Bass FMP)

1. Commercial fishery

a. Characterization of fishery (seasons, cap, gears, regulations)

Annual commercial landings of striped bass are dictated by an annual quota allocation. In Rhode Island, the quota is divided between a general category (61%) and the floating fish traps (39%). Within each gear type, a percentage of the quota is allotted to separate sub-periods in the calendar year (see section III.C.1 for details). Trends in the seasonality of landings in the general category are strongly tied to the quota availability. The majority of striped bass landed during the first sub-period for the general category are typically caught within a month and a half of the opening day for each sub-period. The floating fish trap fishery is open year round, though trap fisherman typically set their traps in May and fish through mid- to late October. 100% of the fish trap's quota allocation was taken in 2011.

The start date of the first sub-period for the general category was June 6<sup>th</sup> with a minimum size of 34". The start of the second sub-period was

September 4<sup>th</sup> with a minimum size of 34" (RIMF Reg. Part 12.3). The possession limit during both sub-periods for the general category was five fish per vessel per calendar day. Allocation of the general category quota between the sub-periods remained the same (75/25). During both sub-periods, the fishery was closed each calendar week from 12:00 AM Friday until 11:59 PM Saturday and commercial possession and sale of striped bass on these days was prohibited.

b. Characterization of directed harvest

i. Landings and method of estimation

Rhode Island commercial landings of striped bass were available from Rhode Island's SAFIS database (see section III.C.1; N. Travisono, RIDFW Marine Fisheries Section, pers. comm.). In 2011, a total of 228,163 lbs of striped bass were landed in Rhode Island by commercial fisheries. Of this total, the commercial floating fish trap fishery catch was 93,864 lbs and 134,299 lbs were taken by the general category, which is primarily rod and reel.

ii. Catch composition

(1) Length frequency

The RIDFW samples striped bass caught by commercial floating fish traps and rod and reel fisheries. Every individual striped bass observed is measured for fork length (inches) and weighed (pounds). The fork length measurements were converted to total lengths using:

$$TL = 0.03 + 1.07 FL \quad (1)$$

The proportion of striped bass at length caught in the commercial fisheries was assumed equal to the proportion of striped bass at length sampled from the commercial landings by gear type. The total number of striped bass commercial landings was estimated for each fishery by using the sample numbers and weights to extrapolate to the total weight landed. The length frequency for each gear was expanded to the estimated number of striped bass caught for the respective gear, providing estimates of the length distribution of commercial striped bass landings for both the rod and reel and floating fish trap fisheries. In 2011, the RIDFW collected 265 striped bass lengths from the commercial fish traps and 360 from the rod and reel fishery (N. Travisono, RIDFW Marine Fisheries Section, pers. comm.).

(2) Age frequency

Scales are removed from each striped bass that is weighed and measured in the RIDFW's commercial fisheries sampling program. Ageing of the scale samples collected in 2011 is still in progress. An age-length key was obtained from NYS DEC (C. Hoffman, NYS DEC Diadromous Fish Unit, pers. comm.). The keys were applied to the

commercial length frequencies to estimate the commercial fishery catch-at-age for each gear. Once all the scales are aged, the commercial catch-at-age data will be updated with RI age-length keys for each gear type.

(3) Sex

Rhode Island's commercial fishery sampling program does not record the sex of striped bass sampled.

c. Characterization of other losses (poaching, bycatch, etc.)

Information on other striped bass losses in Rhode Island's commercial fisheries is not available or unknown.

2. Recreational fishery

a. Characterization of fishery (seasons, cap, gears, regulations)

In 2011 the recreational fishery for striped bass in Rhode Island was subject to a 28 in. minimum size limit and a possession limit of 2 fish per person per day. The recreational fishery for striped bass is open year-round, though it is most active during waves 3 through 5 (NMFS, Fisheries Statistics and Economics Division, Silver Spring, MD, pers. comm.). The majority of the harvest (Type A + B1) in numbers is taken by the private/rental boat mode. The estimated number of striped bass released alive (Type B2) by recreational anglers usually exceeds the number harvested in a given year. Over the last year, the number of live releases has been, on average, 2.5 times larger than the recreational harvest.

b. Characterization of directed harvest

i. Landings and method of estimation

Data characterizing striped bass caught by recreational anglers in Rhode Island were obtained from MRIP (NMFS, pers. comm.). Rhode Island's recreational fishery for striped bass harvested (Type A + B1) 88,635 striped bass in 2011. The weight of the 2011 recreational harvest was estimated to equal 1,257,302 lb (see table above for MRFSS estimates for 2011).

ii. Catch composition

(1) Length frequency (legal and sub-legal catch)

Currently, the only source of fishery-dependent sampling of striped bass caught in Rhode Island recreational fisheries is MRIP. Typically the length distribution of Rhode Island's recreational harvest (Type A + B1) of striped bass is based on the MRFSS?MRIP sample length measurements. Due to only five length bins being sampled in 2011 in MRIP, sample length measurements for RI's recreational fishery were based on the American Littoral Society's (ALS) release data for Rhode

Island (ALS data provided by G. Shepherd, NMFS). The sample numbers at length were expanded to the estimate of recreational harvest to provide the length frequency distribution of recreationally harvested striped bass for 2011.

(2) Age frequency

The age composition of Rhode Island's recreational harvest was based on age sample data provided by the New York DEC. The age-length key from this source was applied to the recreational harvest expanded numbers at length to estimate the recreational harvest catch-at-age for striped bass. (See Compliance Worksheet)

c. Characterization of other losses (poaching, hook and release mortality, etc.)

i. Estimate and method of estimation

MRFSS/MRIP provides estimates of the number of striped bass released alive (Type B2) by recreational anglers (NMFS, pers. comm.). In 2011, the number of striped bass released alive in Rhode Island recreational fisheries was an estimated 214,302 fish. A discard mortality rate of 8% was applied to the number of live releases to estimate the number of dead discards. The estimated number of dead discards in Rhode Island during the 2011 recreational fishery was 17,144 fish.

ii. Estimate of catch composition

The size structure of striped bass released from Rhode Island's recreational fishery was based on the American Littoral Society's (ALS) release data for Rhode Island (ALS data provided by G. Shepherd, NMFS). The proportion of recreational releases at length was assumed equal to the proportion at length of striped bass sampled in the 2011 ALS tagging program. In 2011, length data were available from 671 striped bass released in Rhode Island waters. The proportion at length, based on the ALS samples, was expanded to the estimated number of dead discards to represent the length frequency of striped bass released from the recreational fishery that do not survive.

The NY age-length key that was used to estimate the age of Rhode Island's recreational harvest was also applied to the length frequencies of the striped bass dead discards to estimate recreational catch-at-age of dead discards from the recreational fishery. (See Compliance Worksheet)

3. Other losses

The RIDFW is not aware of any striped bass losses other than those discussed above.

4. Harvest and losses - including all above estimates in numbers and weight (pounds) of fish, and mean weight per fish for each gear type.

The estimated numbers, weights (pounds), and mean individual weights (pounds) of striped bass caught in Rhode Island waters in 2011 are summarized in the following table:

Fishery	Gear/Type	Total		Individual
		Number	Weight (lb)	Average Weight (lb)
Commercial	Rod & Reel	4985	134,299	23
	Floating Fish Traps	7711	93,864	11
Recreational	Harvest	88,635	1,257,302	14.2
	Dead Releases	17,144	N/A	N/A

B. Required fishery-independent monitoring programs (refer to Table 7 and 8 in Amendment 6 to the Atlantic Striped Bass FMP)

1. Description of requirement as outlined in Atlantic Striped Bass Amendment 6

According to section 3.1.2 of Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass, hereafter referred to as “Amendment 6”, the state of Rhode Island is not required to conduct an annual juvenile abundance index survey (ASMFC 2003). Rhode Island is also not required to perform a spawning stock assessment survey, as stipulated in section 3.2 of Amendment 6. Rhode Island does not currently have a tagging program for striped bass.

C. Copy of regulations that were in effect, including a reference to the specific compliance criteria as mandated in the FMP

1. Commercial

A commercial fishing license is required to take striped bass for commercial purposes from Rhode Island waters. Gillnetting for striped bass is not permitted in Rhode Island waters (RIMF Reg. Part 12.6 2006b). Rhode Island regulations stipulate that striped bass must be identified with a special commercial tag before being sold (RIMF Reg. Part 12.4 2006b). These tags are provided by the RIDFW.

Striped bass commercial fisheries in Rhode Island are managed by gear category—a general category, which is primarily rod and reel, and the floating fish traps. In accordance with section 4.3.1 of Amendment 6 (ASMFC 2003), Rhode Island has established a minimum size limit of 26 in. for striped bass caught by commercial floating fish traps (RIMF Reg. Part 7.5 2006a; RIMF Reg. Part 12.1, 12.5 2006b). The minimum size limit for the general category is 34 in. (RIMF Reg. Part 12.3 2006b). Rhode Island is allocated an annual quota for the commercial landings of striped bass, as discussed in section 4.3.2 of Amendment 6 (ASMFC 2003). Rhode Island divides the commercial quota between the general category (61%) and the floating fish traps (39%) (RIMF Reg. Part 12.5 2006b). Following ASMFC Striped Bass Board

approval in August 2007 the commercial floating fish trap minimum size changed from 28" to 26".

The commercial quota for the general category is available during two sub-periods within the year (RIMF Reg. Part 12.3 2006b). Commercial fishing for striped bass is closed to the general category from January 1st to June 5<sup>th</sup>. The first sub-period begins June 6<sup>th</sup> and ends August 31<sup>st</sup>; during this sub-period, 75% of the general category quota is available. The possession limit is five fish per calendar day in this sub-period. The remaining 25% of the quota is available in the second sub-period, from September 4<sup>th</sup> through December 31<sup>st</sup>. Each license holder is permitted five fish per calendar day during the second sub-period. Projections are used to determine when the quota will be harvested, which triggers the close of the fishery.

The entire (100%) floating fish trap quota is available January 1<sup>st</sup> through December 31<sup>th</sup>, (RIMF Reg. Part 12.5 2006b). There are no possession limits during this time and the fishery closes once the quota has been reached. If on November 1<sup>st</sup>, any of the floating fish trap quota remains, that poundage will be committed to a general category available to the entire commercial fishery.

As of March 2006, all RI-licensed seafood dealers are required to submit electronic reports to the Standard Atlantic Fisheries Information System, or SAFIS (RIMF Reg. Part 19.14 2006c). SAFIS requires seafood dealers to collect trip level information on commercial catches landed and purchased in Rhode Island. In addition to SAFIS, all commercial harvesters are required to record trip level catch and effort in harvester logbooks. Both SAFIS and the RI harvester logbook follow the data standards developed by the Atlantic Coastal Cooperative Statistics Survey Program (ACCSP).

## 2. Recreational

Rhode Island does require a license for recreational fishing in marine waters. Recreational fishing for striped bass is permitted throughout the year. In accordance with section 4.2.1 of Amendment 6 (ASMFC 2003), Rhode Island has instituted a minimum size limit of 28 inches (RIMF Reg. Part 7.5 2006a; RIMF Reg. Part 12.1 2006b) and a possession limit of 2 fish per person per day (RIMF Reg. Part 12.1 2006b) for striped bass caught in the recreational fishery.

## D. Harvest broken down by commercial (by gear type where applicable) and recreational, and non-harvest losses (when available)

Harvest of striped bass in Rhode Island waters in 2011 by fishery in gear is summarized in the following table:

<b>Fishery</b>	<b>Gear/Type</b>	<b>Number</b>	<b>Weight (lb)</b>
Commercial	Rod & Reel	4985	134,299
	Floating Fish Traps	7711	93,864
Recreational	Harvest	88,635	1,257,302
	Dead Releases	17,144	N/A

- E. Review of progress in implementing habitat recommendations  
Unknown.

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

- A. Summarize regulations that will be in effect (copy of current regulations if different from III C)

1. Commercial

RI-licensed seafood dealers are required to report data on commercial catches landed and purchased in Rhode Island. Commercial harvesters are required to record catch and effort data in harvester logbooks.

**Gen Category:**

There will be little change to the management of the general category within the striped bass commercial fisheries in 2012. The start date of the first sub-period for this category will be June 6<sup>th</sup> (RIMF Reg. Part 12.3). The possession limit during both sub-periods for the general category will be five fish per vessel per calendar day. Allocation of the general category quota between the sub-periods will be 75/25. During both sub-periods, the fishery will be closed each calendar week from 12:00 AM Friday until 11:59 PM Saturday and commercial possession and sale of striped bass on these days will be prohibited.

**Fish Trap**

Rhode Island submitted a proposal in 2007 for lowering the current minimum size limit in the commercial floating fish traps fishery to 26" while reducing the fish trap quota to 93,586 lb. The request was approved the ASMFC Striped Bass Management Board.

**2012 Striped Bass Gen Cat**

<b>Period</b>	<b>Period Percentage</b>	<b>Period Allocation</b>	<b>Total Landings</b>
June 6 - Aug 31	75%	117,102	0
Sept 11 - Dec31	25%	29,275	0
2012 Total	100%	146,377	



## 2012 Striped Bass Fish Trap

Period	Period Percentage	Period Allocation	2011 Overage	Quota Allocation
Jan 1 -Dec 31, 2012	100%	93,586	320	93,266
2012 Total				93,266

### 2. Recreational

There are no changes planned regarding the regulation of recreational fishing for striped bass in Rhode Island during 2012. The minimum size limit of 28 in and possession limit of 2 striped bass per person per day will remain in effect.

#### B. Summarize monitoring programs that will be performed

In 2012, SAFIS reporting requirements will remain in effect for all RI-licensed seafood dealers. This includes trip-level reporting of catches landed and purchased in Rhode Island. Commercial harvesters will keep logbooks for recording trip-level catch and effort directed in commercial fisheries.

The RIDFW commercial dockside sampling program will continue to collect striped bass samples from the commercial floating fish traps and rod and reel fisheries.

#### C. Highlight any changes from the previous year

Rhode Island's management of the commercial general (rod and reel) fishery for striped bass was not modified in 2012.

A proposal to change the minimum size limit for Rhode Island's floating fish trap fishery for striped bass was approved by the ASMFC Striped Bass Management Board and was in effect in 2007. See report **Conservation Equivalency of Alternative Minimum Size Limits in Rhode Island's Commercial Trap Net Fishery for Striped Bass. Report to the Rhode Island Striped Bass Advisory Panel.**

**L.Lee ASMFC Stock Assessment Biologist January 2007**

#### D. Errors in previous years compliance reports

In completing the 2011 annual report workbook, it was noticed that an error was made in the 2009 and 2010 annual workbooks. When copying and pasting the age-length key into the recreational worksheet (Rec tab), the key was accidentally shifted over by one year. These workbooks have been corrected and have been submitted with this compliance report.

## References

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# Connecticut Commercial Striped Bass Quota Utilization Plan

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## Initial Year Report (2011)

Commercial striped bass quota was used for the first time in Connecticut during 2011. Under Amendment 6 of the Striped Bass Fishery Management Plan Connecticut's commercial striped bass quota is 23,750 pounds. Beginning in spring 2011, Connecticut utilized this quota through a "bonus" recreational fishing program on the Connecticut River under an open slot limit from 22 to 27.9 inches total length. The conservation equivalency calculation of pounds to numbers of fish is very conservatively estimated to be 4,025 fish in this slot.

## Recap of the Program

This small quota was utilized to permit recreational harvest of striped bass that are not accessible under the current 28 inch / 2 fish coastal recreational management limits. This new fishery was crafted to provide the dual benefits of a unique angling opportunity, particularly around the cities of Hartford and Middletown, and a means of practicing a limited form of "ecosystem management" by targeting striped bass where they prey on vulnerable populations of river herring, during their spring spawning migration up-river.

## Monitoring Results

### Harvest

Compliance with the harvest limit was achieved through a "tag" system whereby 4,025 (the quota in numbers of fish) post cards (see Appendix 1.) were made available to the public predominantly from agency offices. Per instructions, anglers filled in the tag (Appendix 1) immediately upon harvesting a bass, marking the month, day and length of the fish. The anglers kept the tag with the fish until returning home as authorization to possess the otherwise undersize fish for law enforcement purposes. Successful anglers were then required to mail the postage paid card back to Marine Fisheries.

A total of 80 tags were returned containing information from harvested fish. Four other tags were returned unused. Another 34 "protest" tags were returned, all from one individual with messages indicating his opposition to the program. Since only 2 tags were offered to an individual per day, this gentleman apparently visited agency offices at least 17 times in order to take tags out of the system for public use.

The low harvest rate is primarily attributed to high river flows associated with the wettest year in Connecticut history. A pattern of inverse catch rates to river flow is apparent in the figures below (Appendix 2) depicting daily catch rates and river flow data provided by USGS.

## Biological Sampling

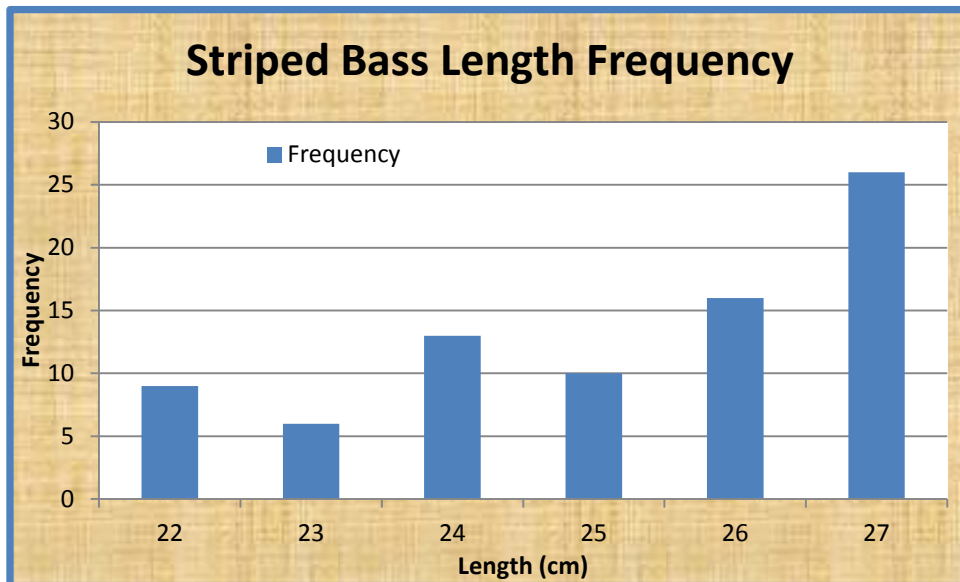
Fish harvested spanned the 22 to <28 inch size range allowed under the program with a general increasing trend with size (Figure 1, Table 1.).

Table 1. Length frequency of striped bass harvested under the bonus fishery program in 2011.

TL (cm)	Freq
22	9
23	6
24	13
25	10
26	16
27	26

80 = total number of measured striped bass

Figure 1. Length frequency of striped bass harvested under the bonus fishery program in 2011.



## Assessment of Program

The bonus program was well received by the public, including the membership of our recreational fishery Marine Advisory Group and Fisheries Advisory Council. Media coverage was positive and the program served a very important outreach function as a tangible demonstration of agency efforts to provide recreational fishing opportunity to urban communities as well as the general public. The program provided an opportunity to work directly with “Riverfront Recapture” in the Hartford area, a group actively involved in efforts to improve the waterfront and attract urban populations to the river to enjoy and appreciate its beauty. Direct distribution of many vouchers through Law Enforcement

staff provided important positive interactions for officers with the public while also enabling the program to reach out to anglers who are not internet connected or otherwise likely to be aware of and participate in the program.

Actual harvest was well less than expected due largely to poor river conditions (high flows, turbidity, flooding). The card return system provided an efficient means of monitoring the size composition of the harvest and in providing a minimum estimate of the number of fish harvested.

Program modifications will be considered for 2012 including expansion of the program outside the Connecticut River basin in order “hedge our bets” on local fishing conditions as well as to respond to public calls for similar opportunities in other parts of the state. Such expansion will be considered in the context of balancing the dual purposes of this program: mitigating predation pressure on river herring populations and providing public fishing opportunity, particularly in urban areas.

Appendix 1.

Sample Voucher.

### 2011 Connecticut River Bonus Striped Bass Voucher



Circle the date and total length (inches)

May							June								
1	2	3	4	5	6	7									
8	9	10	11	12	13	14	5	6	7	8	9	10	11		
15	16	17	18	19	20	21	12	13	14	15	16	17	18		
22	23	24	25	26	27	28	19	20	21	22	23	24	25		
29	30	31					26	27	28	29	30				
<b>Total length:</b> 22" 23" 24" 25" 26" 27"															

**Instructions:** Immediately upon harvest of a qualifying bonus striped bass, use an INK PEN to circle the date of harvest and total length. Drop fractional lengths; for example, mark 25 3/4" as 25".

**Important:** Keep this voucher with the fish until you reach home. Once home, please drop this card in any mailbox; postage is prepaid. Mailing this voucher will provide us with important data necessary to ensure continuation of this program.

- This voucher is good for retention of ONE (1) bonus striped bass.

- TWO (2) bonus fish may be harvested on any day.

- Valid only from May 1 through June 30, 2011.

- Valid only if completed immediately upon harvest of a qualifying fish.

- Valid only in the Inland District of the Connecticut River (i.e. above the I-95 bridge).

- Fish must be from 22" up to (but not including) 28" total length.

- The normal limit of two fish  $\geq$  28" may also be harvested.

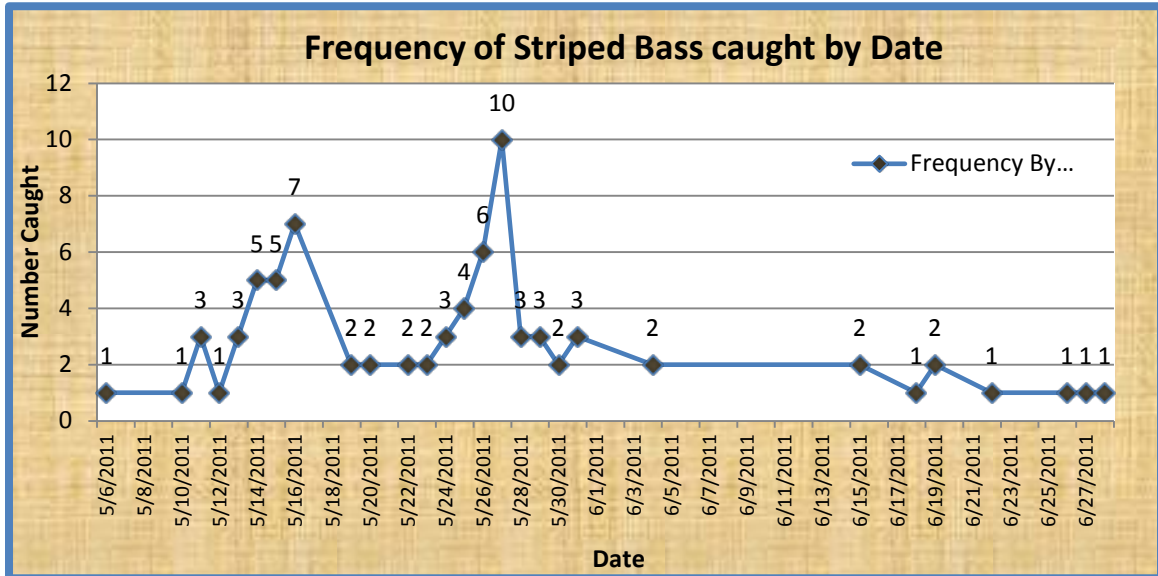
#### Questions?

Web: [www.ct.gov/dep/striper](http://www.ct.gov/dep/striper)

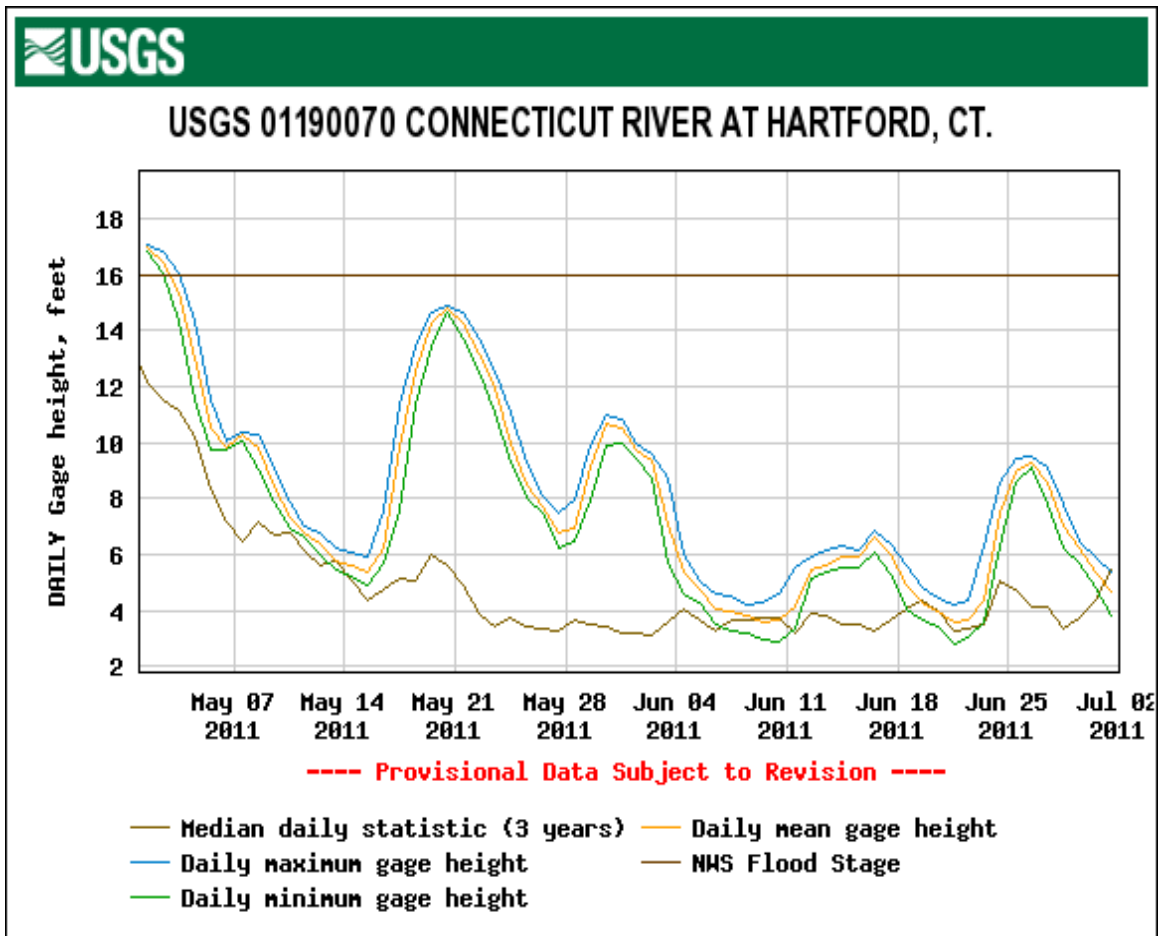
Phone: 860-434-6043

E-mail: [dep.marine.fisheries@ct.gov](mailto:dep.marine.fisheries@ct.gov)

Appendix 2.  
 Striped bass daily catch frequency in the bonus fishery.



USGS daily gage height for the Connecticut River.



**2011 New York State**  
**Compliance Report to the Atlantic States Marine Fisheries Commission**  
**on the Harvest, By-Catch, and Fishery Independent Surveys for Atlantic Striped**  
**Bass**  
**Prepared by:**

**The Diadromous Fisheries Investigation and Management Unit, and**  
**The Hudson River Fisheries Unit**

I. Harvest and Losses:

**A. Commercial Fishery:**

a. Coastal Regulations:

1. Characterization of Fishery (Season, Cap, Gears, and Regulations):

Permit: Required.

Size Limit: 24 inches to 36 inches total length.

Harvest Cap: 828,293 pounds.

Gear Restrictions: Gears allowed include gill nets (6 to 8 inch stretched mesh), pound nets, and Hook and Line. Gillnets with mesh <6 or >8 inches stretched mesh, are allowed a 7 fish by-catch trip limit per vessel; trawl vessels are allowed a 21 fish trip limit per vessel. No gill nets are allowed Great South Bay, South Oyster Bay, or Hempstead Bay.

Open Season: July 1 to December 15.

Season will close if projected harvest cap is exceeded.

b. Hudson River Regulations:

Commercial sale of striped bass has been banned in the Hudson River since 1976 due to PCB contamination.



## 2. Characterization of Directed Harvest:

### a. Landings and Method of Estimation:

#### 1. Method of Estimation:

Fishermen are required by regulation to tag each striped bass harvested, and to file weekly reports of tag use. Landings data are obtained directly from the weekly reports (Tables 1 and 2). A commercial fishery monitoring program was conducted in 2011 during which 535 striped bass were sampled at packing houses, wholesale and retail markets, and in the field.

Based on the weekly report data, New York's harvest was 854,731 pounds, which was 26,438 pounds more than the allowable quota for 2011.

### b. Catch Composition:

The size and age distribution of the 2011 commercial harvest was determined through the commercial monitoring program. Scales were collected for age determination. The age and size frequencies are reported in Tables 3 and 5.

#### I. Age Frequency:

Table 3 provides the age frequency of the commercial harvest estimated from the commercial monitoring samples. Ages ranged from 4 to 13 years. The majority of the harvest (77%) was among fish ages 6 through 8, comprising the 2003, 2004, and 2005 year classes.

Weight at age for the commercial harvest was developed from the 2011 commercial monitoring data. The number of fish by age in the harvest (Table 3) were multiplied by the average weight at age, to estimate the weight of the 2011 commercial harvest (Table 4). Any differences in the total harvest weight as estimated using these methods versus the reported harvest weight are probably due to slight variations due to method, sampling error, and rounding.

#### ii. Length Frequency:

Striped bass sampled from the 2011 commercial harvest ranged from 24 to 37 inches total length (TL) (Table 5). The most prevalent among the samples were fish in the 29 to 32 inch range which accounted for 53% of the harvest. For comparison to the commercial harvest length frequency, Table 6 provides length frequency information from the N.Y. Ocean Trawl Survey, the commercial monitoring samples and samples collected from the American Littoral Society's Tagging Program. The Ocean Trawl data was collected in a portion of the open commercial geographic area during October through December, independent of the commercial fishery. The ALS samples are from New York's marine waters collected from recreational anglers.

iii. Weight at Length, and Weight at Age:

Weight, length, and age information by year is needed to develop catch at age matrices of striped bass mortalities for the models. Weight at length, and weight at age equations from 1987 to 2006 from the N.Y. Ocean Haul Seine (OHS) Survey, and from the 2007 – 2011 Ocean Trawl surveys, are presented in Tables 7 (7a) and 8 (8a). (NY did a limited Ocean Trawl Survey in 2008, and was unable to obtain striped bass weight data).

iv. Sex Composition

No sex composition information is available.

c. Estimation of Effort:

Participation in New York's commercial striped bass fishery for 2011 was limited to fishers who held striped bass permits in any year between 1984 through 1995. In 2011, 469 fishermen participated in the striped bass commercial fishery. Table 9 provides a summary of their catch per unit of effort, by participant, by trip, by gear.

3. Characterization of Losses (Poaching, Bycatch, etc.):

a. Open Season Bycatch Mortality Estimates and Method of Estimation:

I. Marine District Gill Net Fishery:

1. Open Season Bycatch Mortality Estimates:

Based upon the weekly reports from the striped bass commercial gill net fishers, a direct estimate of bycatch losses was made. The reported bycatch of striped bass was 600 fish. Using the bycatch mortality figure reported by Seagraves and Miller (1989) of 0.47, the estimate of bycatch loss during the open season is 282 striped bass. The estimated weight lost is derived by using a mean weight of 3.2 pounds/fish (Young, 1990). The estimated weight of the bycatch loss is 902 pounds.

ii. Hudson River Bycatch in Shad and Bait Gill Nets:

In the past, the commercial gill net fishery in The Hudson River estuary occurred in the spring and exploited spawning stocks of American Shad. Striped bass were taken as a bycatch in this fishery, but could not be sold, due to PCB contamination. Fish were caught by drifted and fixed gears. As of 2010, both commercial and recreational shad fishing is no longer permitted, either in Hudson River or in Marine Waters.

In order to continue to monitor striped bass bycatch in the Hudson River, we will now be compiling information on the reported number of striped bass taken in the bait (primarily river herring) gill net fishery (Table 10).

iii. Marine District Pound Net Fishery:

1. Open Season Bycatch Mortality Estimates:

Based upon the weekly reports from the pound nets a direct estimate of bycatch was made. The reported by-catch was 57 striped bass. There are no reliable estimates of bycatch mortality from pound nets, although it is assumed to be low. In past annual reports to ASMFC a 5% bycatch mortality rate was used (Young, 1990). Therefore, for consistency, the 5% bycatch mortality for pound nets will be used again. The estimated bycatch loss from pound nets is 3 fish. The mean weight of these fish is estimated at 2.0 pounds (Young, 1990). The estimated weight of bycatch loss in pound nets is 6 pounds.

iv. Hook and Line Fishery (Coastal);

1. Open Season Bycatch Mortality Estimates:

A direct estimate of the commercial hook and line bycatch is taken from the weekly reports filed during the open season. Commercial hook and line striped bass fishermen reported a by-catch of 2,938 striped bass. In past reports we have used an 8% hook and release mortality rate for the commercial hook and line fishery. We believe that 8% is too low due to changes in the nature of the commercial hook and line fishery for striped bass. Anecdotal reports suggest that many of the commercial hook and line fishers are fishing with bait. Diodati (1991) estimated a 13% hook and release mortality rate due to single hooks (range from 9.6 to 29.4 % depending on hooking site) as compared to 2.8% for treble hooks (the weighted average was 7.9%). Therefore, a mortality rate of 13% will be applied to discards from the commercial hook and line fishery. The estimated loss of striped bass from the hook and line commercial fishery during the open season is 382 fish, which converts to 1,910 lbs using an average weight of 5.0 lbs/fish (Young, 1990).

v. Hook and Line Bycatch Losses (Hudson River):

No commercial season. All estimates of bycatch are attributed to the recreational fishery.

vi. Marine District Trawl Fishery:

1. Open Season Bycatch Mortality:

Based upon the weekly reports from trawl gear a direct estimate of bycatch mortality was made. The reported bycatch was 325 striped bass. Using an estimated bycatch mortality of 0.35 (Crecco, 1990) the estimated by-catch mortality is 114 striped bass. Using an average weight of 3.2 pounds/fish (Young, 1990), the bycatch mortality in weight was 365 pounds.

b. Closed Season Bycatch Mortality Estimates:

No information was collected which could be used to reliably estimate the discard losses during the closed season for striped bass. In past reports, a variety of methods were employed to estimate these losses. Since the nature of the fishery for striped bass has changed over time, it is thought that these methods are no longer valid for estimating discard losses in any of New York's commercial fisheries. Other information, unavailable at this time, including direct measurements obtained from observer data collected over broad geographic and temporal scales, will be necessary to produce reliable estimates of discard losses in these fisheries. Collection of these data will require significant funding from Federal and State agencies, as well as cooperation from the regulated industries.

c. Estimated Catch Composition (length/age) of by-catch:

Table 6 presents OHS (Ocean Trawl for 2011) and ALS data which were collected during the open commercial season in the open area (the OHS/Ocean Trawl data is from October through December only). These data display the length distribution of the total catch, including fish outside the commercial slot limit, which would be subject to discard mortality.

**B. Recreational Fishery:**

1. Characterization of the Fishery (seasons, cap, gears, regulations).

a. Marine District Regulations:

I. Licensed Party/Charter Boat anglers:

Minimum Length 28 “, possession limit 2 fish.

II. All other Anglers:

Minimum Length 28" - 40", possession limit 1 fish,  
**and**  
>40" - possession limit: 1 fish.

Open Season: April 15 to December 15.

Fish may be taken by angling or spearing only.

b. Hudson River Regulations:

Minimum Length: 18" total length.

Possession Limit: 1 fish.

Open Season: March 16 to November 30.

c. Delaware River Regulations:

Minimum Length: 28" total length.

Possession Limit: 2 fish.

Open Season: all year.

## 2. Characterization of Directed Harvest:

### Marine District:

#### a. Landings and Method of Estimation:

NOAA provides estimates of striped bass recreational harvest in New York's coastal waters. MRIP estimates for 2011 indicate that 674,844 striped bass were harvested in New York during 2011 (vs. 622,025 MRFSS estimate) with a MRIP proportional standard error (PSE) of 9.8 (MRFSS website). The MRIP estimated total weight of the 2011 harvest was 8,969,762 pounds (PSE = 10); vs. 7,849,403 lbs by MRFSS estimate, resulting in an average weight per harvested fish of 13.3 (MRIP,) or 12.6 (MRFSS), pounds.

#### b. Catch Composition:

##### ii. Length Frequency

Length data provided by New York recreational anglers was available from the American Littoral Society (ALS) tag releases for 2011. Table 11A presents the length frequency by wave from ALS tag releases in New York for 2011. Length measurements were converted from fork length (FL) to total length (TL) using the equation  $TL(\text{inches}) = (FL(\text{inches}) * 1.07) + 0.03$  (Western Long Island striped bass data). Due to the conversion and use of inch increments, two increments ("bins") were empty (22" and 38"). The missing bins were estimated by averaging the values in bins before and after missing values. The percentages were then rescaled back to 100% (Table 11B). Table 12 provides the adjusted length frequency.

An estimate of the 2011 recreational harvest by length is presented in Tables 13 (MRFSS) and 13A (MRIP). Harvest numbers were multiplied by the relative frequency of fish (derived from total length conversion of MRIP fork length data) to estimate the number of fish harvested by length.

## I. Age Frequency:

New York conducts a Cooperative Anglers program which collects scale samples from recreational anglers. Cooperative Anglers program samples, accompanied by age samples collected from the Western Long Island and Ocean Trawl surveys were used to develop age-length keys for 2011 (Tables 14A and 14B). The age/length keys were used to estimate recreational harvest by age, as presented in Table 15 (MRFSS data) and Table 15 A (MRIP data) To determine harvested weight at age, average weight at age was fitted with the Ln-transformed regression equation using data from the 2011 Ocean Trawl survey, then scaled to the MRFSS or MRIP harvest estimates. Weight estimates by age are presented in Tables 15B (MRFSS) and 15C (MRIP).

### c. Estimation of Effort:

The MRIP effort time series indicates that there were a total of 4,168,045 angler trips conducted in 2011 (4,266,598 MRFSS estimate). This represents a 4.7% (MRIP) or 4.5 % (MRFSS) decrease than the number of trips taken in 2010.

## 3. Characterization of Losses (Poaching, Hook and Release, etc.)

### a. Estimate and Method of Calculation:

The MRFSS and MRIP provide the estimates of striped bass catch ( $A+B_1+B_2$ ); harvest ( $A+B_1$ ); and releases ( $B_2$ 's) for New York waters. Poaching and bycatch mortalities were estimated as described in Shepherd (1992).

In the past, NY poaching mortality had been estimated as 1.3% of the released fish (Shepherd, 1992). Using this method, in 2011, the number of released fish from MRIP/MRFSS, the  $B_2$ 's, (1,506,080 MRIP; 1,539,702 MRFSS) would be multiplied by the poaching rate (1.3%) to give an estimated 19,579 (MRIP) or 20,016 (MRFSS) poaching mortality of fish. An average of 5 pounds per fish would be used to estimate the total weight of striped bass which were subject to poaching, yielding an estimate of 97,895 (MRIP) or 100,080 (MRFSS) pounds. However, this number represents “honest poaching”, i.e., short fish that may have been taken inadvertently, and not fish that were deliberately illegally harvested. At the present time, we have no good estimates for illegal poaching rates or its associated mortality.

Bycatch mortality was estimated as 8% of the released fish. This produces a by-catch mortality of 120,486 (MRIP) or 123,176 (MRFSS) fish for 2011 (Tables 16A and 16).

The length distribution of the by-catch mortalities was estimated using adjusted ALS data for all fish caught (Tables 16 and 16A for MRFSS and MRIP data). Length frequency was converted to age using age-length keys from Tables 14A and 14B. Mean weight by age was estimated using the Ln-transformed regression equation from the 2011 Ocean Trawl survey data. An estimate of the total weight of the bycatch mortality losses was calculated as 476,302 (MRIP) or 486,936 (MRFSS) pounds (Tables 17C and 17B).

#### 4. Party/Charter Trip Reports:

Regulations governing fares on specially permitted party and charter boats allow two fish greater than twenty-eight inches in possession. Party/charter boat captains who obtained this special permit were required to send in reports for each trip where they catch a striped bass.

##### a. Landings and Method of Estimation:

Seven thousand three hundred thirty three (7,633) trip reports were received and used to estimate party/charter boat landings for April 15 - December 15, 2011. A total of 87,137 striped bass were reported caught. The reported harvest for 2011 was 55,587 fish which were estimated to weigh 832,137 pounds. Weight was reported for approximately 22 % of the number of fish harvested, and was used to estimate the total poundage caught. Mean weight of harvested fish was 14.97 pounds (Stern, personal communication). In contrast, the MRIP estimate for the party and charter harvest (A+B1) was 389,438 fish at 5,157,178 pounds, for a mean weight of 13.2 pounds per fish in 2011. Table 18 and Figure 4 provide both data sets for comparison.

##### b. Catch Composition:

Biological information was collected on the party/charter boat harvest, and has been collected through voluntary log books in the marine district that can be subset for fishers who fished by boat.



c. Estimation of Effort:

The trip reports indicated that 72,585 angler trips took place during the 2011 party/charter season. Area fished was examined, and the majority of the trips were taken on the eastern end of Long Island (76%), which was divided between those trips taken on the North Fork near Orient Point (36%) and the South Fork near Montauk (40%).

Hudson River Estuary:

a. Estimate and Method of Calculation:

A creel survey was conducted for the entire Hudson River during the Spring of 2005 (March 16 through June 17). Data from this survey have been released in a comprehensive report (Normandeau, 2007). No creel survey was conducted in 2011.

b. Catch Composition:

Length and age information were collected during the Hudson River recreational creel survey. Data on harvest have been released in a comprehensive report (Normandeau, 2007). No creel survey was conducted in 2011.

Delaware River Estuary:

a. Estimate and Method of Calculation:

There is no estimate of harvest of striped bass from the Delaware River at the present time.

C. Table of Harvest and Losses:

See Table 19.

## II. Required Fishery Independent Monitoring Programs:

A. New York conducts one juvenile abundance survey; a sub-adult survey; a spawning stock survey; an adult coastal stock survey; and participates in the coastal tagging program as outlined in the striped bass fisheries management plan (FMP).

B. New York has undertaken two juvenile surveys in the past; one using a 200 foot beach seine, and another using a 26 foot head rope Carolina wing trawl in the Hudson River estuary. A sub-adult survey in Western Long Island is conducted from May through October using a 200 foot beach seine.

A spawning stock survey is conducted each spring on the Hudson River spawning grounds using either a 500 foot, or a 1,000 foot haul seine. All striped bass greater than 457 mm (18 inches TL) collected during the spawning stock survey are tagged. Supplemental collections of striped bass for tagging are made annually by electro-fishing. However, electro-fishing gear appears to be less efficient in collecting larger individuals and thus does not provide an unbiased size or sex composition of the spawning stock. No collections by electro-fishing were made in 2011.

A coastal adult stock assessment is conducted each fall off eastern Long Island using a 1,800 foot ocean haul seine. Trawl surveys were conducted in 2007 through 2011 instead of an ocean haul seine. The trawls were conducted aboard an 80-foot research vessel. The trawl gear used a 25 m head rope, 30.5 m foot rope, and 12 cm stretch mesh in the wings tapering to 8 cm mesh in the rear and 3 cm stretch mesh in the cod end. Trawls were towed at an average depth of 37 feet, for an average duration of 16 minutes. More detailed descriptions of these programs are found in progress and completion reports submitted to the funding agencies, which are available upon request.

### C. Results:

#### 1. Juvenile Indices:

Table 20 and Figure 5 provide a summary of the Hudson River juvenile indices collected by beach seine. The 2011 Hudson River geometric mean beach seine index of striped bass abundance was 7.30, which was below the long term (1979-2011) average of 13.72, and also below the 25<sup>th</sup> percentile value of 8.60 for the 1979 - 2009 time series, as per Addendum II to Amendment 6 of the Atlantic Striped Bass Interstate Fishery Management Plan (8.48 for the 1979-2011 time series). This value may be low due to Hurricane Irene and Tropical Storm Lee. The sampling crew could not go out until one week later than scheduled, because of debris and flooding in the Hudson River. Table 21 presents the yearling abundance indices from the Western Long Island beach seine survey. The 2011 yearling index was 2.00, which was above the time series average (1.26). Table 22 presents three time series of YOY indices for WLI, based on different subsets of the data. Catch of YOY striped bass in bays adjacent to Long Island Sound suggest an expansion of the nursery area out of the Hudson River.

## 2. Spawning Stock Assessment:

Spawning stock assessment survey results for length frequency, by sex, are in Table 23. No data was collected during 2002 due to staffing shortages. Spawning stock age structure for male and female fish is presented in Table 24.

## 3. Adult Coastal Stock Characterization:

Adult coastal stock characterization survey results are presented in Tables 6, 25, and 26. Table 26 presents geometric mean abundance indices by age from the Ocean Haul Seine survey, and the 2007 – 2011 Trawl surveys.

## 4. Tagging:

New York State is an active participant in the USFWS striped bass coastal tagging program. The following lists the number of striped bass tagged by program for 2011.

Hudson River Spawning Stock Survey -	337
Western Long Island Yearling Survey-	770
Hudson River Juvenile Survey-	0
Ocean Haul Seine Survey, Adult Coastal Stock (Ocean Trawl Survey Conducted in 2011)-	120

## III. Fishery Dependent Monitoring Programs:

In the past, New York conducted a sea sampling program on the Hudson River American Shad gill net fishery in the spring. Reporting of the Hudson shad fishery bycatch data was discontinued in 2010. Also in 2010, the NYSDEC closed the commercial gill net fishery in the river due to the poor condition of the Hudson American Shad stock.

Some bycatch occurs for smaller fish in the small mesh gill net fishery for river herring. Data from this time series will continue to be reported.

## IV. Plans for 2012 Fisheries:

### A. Commercial Fishery:

The 2012 striped bass commercial quota was reduced to 801,855 pounds, due to the 26,438 pound overage of fish caught in 2011.

## B. Recreational Fishery:

### a. Coastal Regulations:

At this time, no regulatory changes are planned for 2012. A New York State salt water recreational fishing license system was implemented in October 2009. It has recently been suspended for two years, and is being replaced by a no-fee registry.

### b. Hudson River Regulations:

Minimum Length: 18" total length

Possession Limit: one fish

Open Season: March 15 to November 30

ASMFC adoption of Amendment VI to the fisheries management plan made several changes to the management of Atlantic striped bass. First, Amendment VI eliminated references to producer areas and the minimum sizes allowed therein, with exceptions allowed for the Chesapeake Bay and the Albermarle Sound/Roanoke River. Second, the Amendment requires all States/Jurisdictions to implement management measures for the recreational fishery that restricts individuals to a 2-fish creel limit and a 28-inch minimum size limit. In December 2003, the ASMFC Management Board approved a proposal from NY showing that 1 fish of 18 inch minimum total length is the conservation equivalent of 2 fish at 28 inch minimum length.

New York is contemplating a proposal to either increase the minimum total length limit to twenty-eight inches, or to have slot limit size options, and to keep the creel limits at one fish.

No changes to the season length are contemplated. However, New York will include in its proposal a requirement for use of circle hooks in bait fisheries, a prohibition on the use of treble hooks, and will propose a fee permit in for-hire fishing businesses with a mandatory requirement of those businesses to participate with the ACCSP for-hire survey. It is uncertain when regulation changes will be promulgated.

### c. Delaware River Regulations

No changes are planned for 2012.

## V. Changes for 2012 Monitoring:

No changes are planned for this time. The Western Long Island sub-adult survey is now be funded under the Dingell-Johnson Sportfish Restoration Act (Wallop-Breaux), and there are still some NOAA-NMFS funds available to conduct the coastal ocean trawl survey.

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**Table 1. Summary of Striped Bass Commercial Harvest from 1990 through 2011  
for all Gears Combined.**

Year	Slot Size Limit (Inches)	Slot Quota (pounds)	Harvest (Pounds)	Harvest (Number)	By-Catch (Number)	Average Weight per Fish (Pounds)
1990	24 - 28	128,287	81,870	11,785		6.95
1991	24 - 29	128,287	105,163	15,064		6.98
1992*	24 - 39	189,639	226,611	20,353	57,089	11.13
1993	24 - 36	134,684	109,362	11,185	37,376	9.78
1994*	24 - 36	171,656	171,279	15,357	69,990	11.15
1995*	24 - 36	681,745	500,784	43,705	48,244	11.46
1996*	24 - 36	590,155	504,350	40,523	107,366	12.45
1997*	24 - 36	590,155	460,762	37,594	53,170	12.26
1998*	24 - 36	590,155	484,900	45,149	45,657	10.74
1999	24 - 36	590,155	491,790	49,914	65,407	9.85
2000	24 - 36	590,155	542,659	54,895	53,433	9.89
2001*	24 - 36	590,155	633,095	58,296	39,108	10.86
2002*	24 - 36	547,215	518,573	47,143	27,458	11.00
2003*	24 - 36	828,293	753,261	68,354	31,532	11.02
2004*	24 - 36	828,293	741,668	70,367	52,664	10.54
2005	24 - 36	828,293	689,821	70,560	22,156	9.78
2006	24 - 36	828,293	688,446	73,528	130,854	9.36
2007	24 - 36	828,293	729,743	78,287	21,683	9.32
2008	24 - 36	828,293	653,100	73,263	5,419	8.91
2009*	24 - 36	828,293	789,891	82,574	5,190	9.57
2010*	24 - 36	828,293	782,402	81,896	3,018	9.55
2011	24 - 36	828,293	854,731	87,349	3,920	9.79

\* - adjusted harvest weight

**Table 2. 2011 Striped Bass Commercial Fisheries Landings and Discards by Gear  
Data Results From Trip Report Database**

Gear	Harvest (Lbs)	Harvest (#)	Bycatch (#)
GILL NET	404,638	41,078	600
HOOK AND LINE	379,950	39,019	2,938
OTTER TRAWL	51,898	5,027	325
TRAP OR POUND NET	18,245	2,225	57
<b>Total</b>	<b>854,731</b>	<b>87,349</b>	<b>3,920</b>

**Table 3. Estimated Age Frequency of Striped Bass Harvested By New York Commercial Fishery 2011.**

Age	YearClass	Frequency	%Frequency
3	2008	0	0.00
4	2007	5,254	6.01
5	2006	3,280	3.76
6	2005	17,193	19.68
7	2004	22,244	25.47
8	2003	27,449	31.42
9	2002	5,398	6.18
10	2001	3,918	4.49
11	2000	1,306	1.50
12	1999	980	1.12
13	1998	327	0.37
<b>Total</b>		<b>87,349</b>	<b>100.00</b>

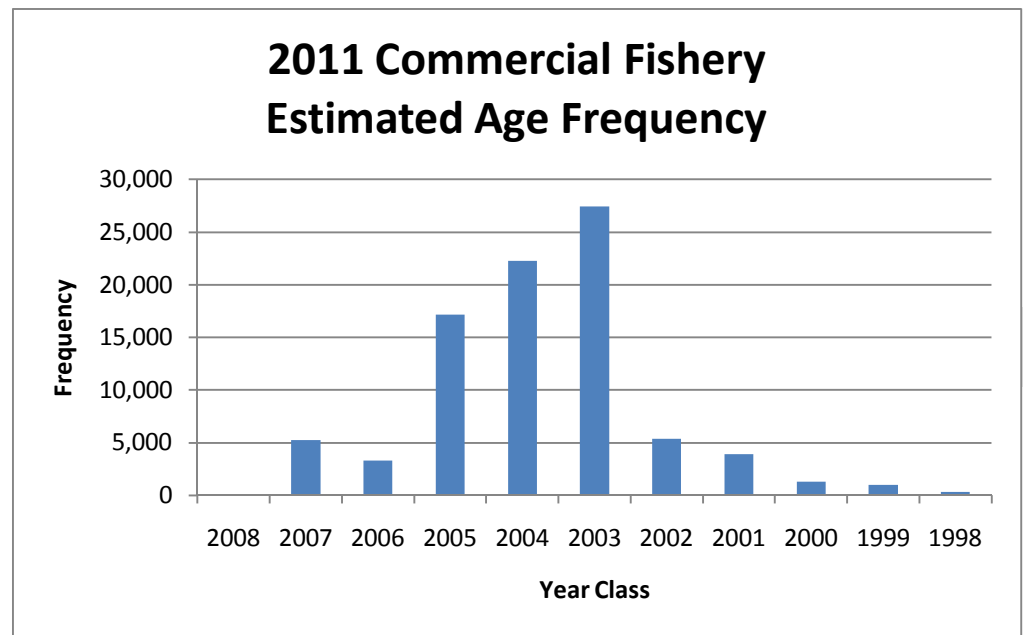


Figure 1. 2011 NY Commercial Striped Bass fishery estimated age frequency, by year class.

**Table 4. 2011 New York Commercial Striped Bass Harvest (Lbs) by Age.**

Age	YearClass	Harvest #	Avg Wt (Lbs)	Harvest (lbs)
3	2008	0	0.00	0
4	2007	5,254	5.96	31,309
5	2006	3,280	6.50	21,334
6	2005	17,193	8.37	143,840
7	2004	22,244	9.58	213,186
8	2003	27,449	10.80	296,500
9	2002	5,398	11.78	63,580
10	2001	3,918	13.21	51,756
11	2000	1,306	11.86	15,484
12	1999	980	13.24	12,979
13	1998	327	14.57	4,763
<b>Total</b>		<b>87,349</b>		<b>854,731</b>

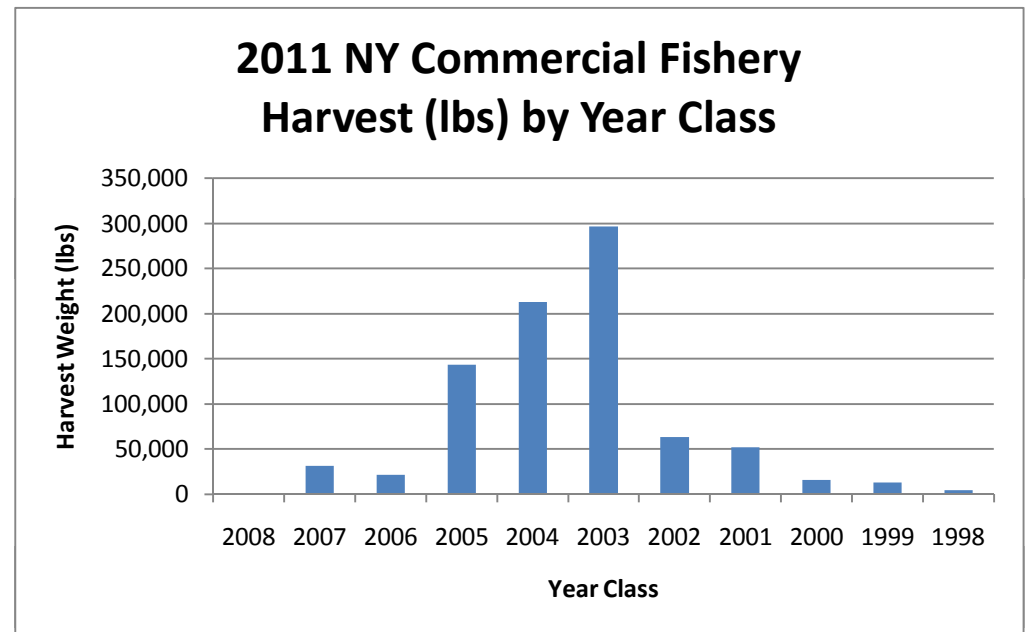


Figure 2. 2011 NY Commercial Striped Bass fishery harvest (lbs), by year class.

**Table 5. 2011 NY Striped Bass Total Length Frequency From Commercial Sampling**

<b>TL (Inch)</b>	<b>Frequency</b>	<b>% Frequency</b>
24	9	1.68
25	19	3.55
26	23	4.30
27	34	6.36
28	49	9.16
29	72	13.46
30	74	13.83
31	74	13.83
32	65	12.15
33	42	7.85
34	37	6.92
35	20	3.74
36	15	2.80
37	2	0.37
38	0	0.00
<b>Total</b>	<b>535</b>	<b>100.00</b>

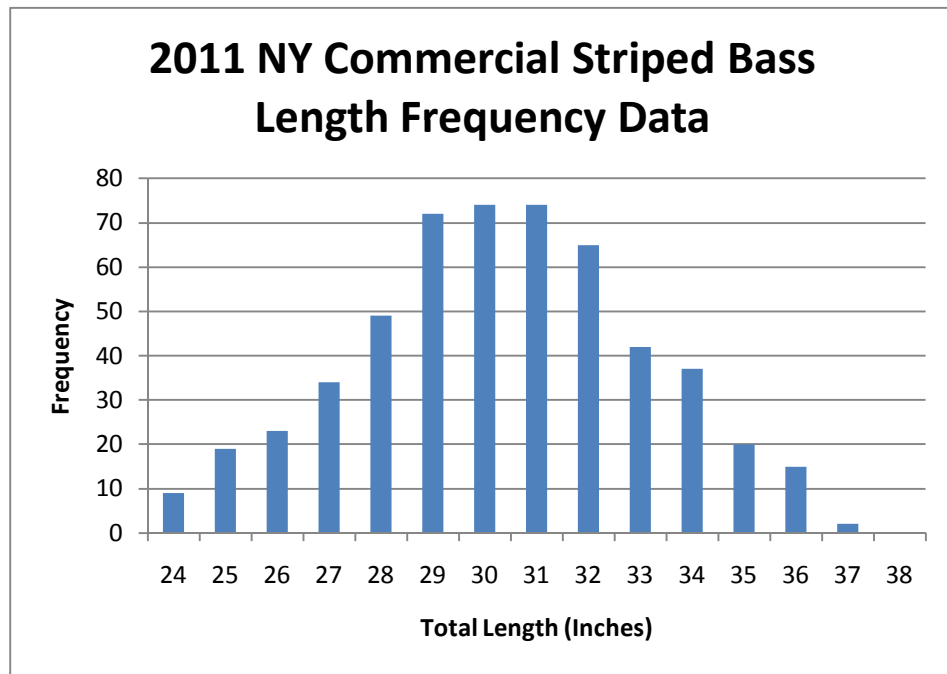


Figure 3. 2011 NY Commercial Striped Bass Length Frequency Data.



**Table 6. 2011 NY Striped Bass Total Length Frequency - Commercial Monitoring, Ocean Trawl Project, and NY ALS Tag Releases.**

<b>TL (inches)</b>	<b>Commercial Monitoring</b>	<b>Ocean Trawl</b>	<b>NY ALS * (July - Dec)</b>
<16	0	0	84
16	0	0	54
17	0	0	74
18	0	0	63
19	0	0	78
20	0	0	66
21	0	0	45
22	0	1	0
23	0	0	38
24	9	2	34
25	19	2	28
26	23	4	35
27	34	7	24
28	49	11	22
29	72	19	11
30	74	16	13
31	74	11	2
32	65	20	9
33	42	12	5
34	37	4	9
35	20	6	3
36	15	0	0
37	2	1	0
38	0	3	0
39	0	0	2
40	0	0	2
41	0	0	0
42	0	1	0
43	0	0	1
44	0	0	1
45	0	0	0
46	0	0	0
47	0	0	0
48	0	0	0
49	0	0	0
50	0	0	0
51	0	0	0
52	0	0	0
<b>Total</b>	<b>535</b>	<b>120</b>	<b>703</b>

\* unadjusted ALS data

**Table 7. Weight-Length Regression Parameters for the Ocean Trawl Surveys : 2007 - 2011.**

Year	a'	a	b	N
2007	-17.3602	2.89E-08	2.844	729
2008*				
2009	-17.8164	1.83E-08	2.916	130
2010	-16.778	5.17 E-08	2.746	387
2011	-20.0915	1.88 E-09	3.242	120

\* No weight data for 2008

**Table 7a. Weight - Length Regression Parameters from the Ocean Haul Seine Survey for 1987 - 2006.**

where  $W(Kg.) = a * L(mm)^b$

Year	a'	a	b	N
1987	-16.9604	4.31E-08	2.77768	1948
1988	-17.6505	2.16E-08	2.88423	2098
1989	-17.3127	3.03E-08	2.83014	1195
1990	-17.1043	3.73E-08	2.79382	2042
1991	-17.8017	1.86E-08	2.90321	1788
1992	-18.1683	1.29E-08	2.96454	1605
1993	-17.853	1.76E-08	2.91345	2201
1994	-17.6743	2.11E-08	2.89258	1709
1995	-17.8144	1.83E-08	2.90203	1484
1996	-18.1523	1.31E-08	2.95374	2198
1997	-17.7472	1.96E-08	2.88747	1662
1998	-18.0409	1.46E-08	2.93527	1577
1999	-17.3032	3.06E-08	2.82133	1396
2000	-17.617	2.23E-08	2.87261	1507
2001	-18.0739	1.41E-08	2.93486	1052
2002	-17.557	2.37E-08	2.8613	1155
2003	-17.4699	2.59E-08	2.85857	819
2004	-17.5504	2.39E-08	2.85692	1519
2005	-17.5431	2.41E-08	2.8557	1037
2006	-17.4868	2.54E-08	2.84588	1208
87 - '06	-17.9434	1.61E-08	2.92483	31200

**Table 8. Gompertz Weight (kg) at Age Parameters for Ocean Trawl Survey. 2007 - 2011.**

Year	Wo	G	g
2007	0.672	3.23	0.1134
2008*			
2009	0.301	3.95	0.1623
2010	1.241	3.96	0.0487
2011	1.559	31.08	0.0050

$$W(t)=W_0 * e^{(G(1-e^{-gt}))}$$

\*No weight data for 2008.

**Table 8a. Gompertz Weight (Kg.) at Age Parameters from the Ocean Haul Seine Survey for 1987 - 2006.**

Year	Wo	G	g
1987	0.405	3.34	0.178
1988	0.869	40.53	0.0056
1989	0.176	5.2	0.1467
1990	0.389	3.2	0.2119
1991	0.911	38.6	0.0056
1992	1.111	37.05	0.0052
1993	0.769	6.13	0.0474
1994	0.39	4.63	0.1127
1995	0.641	5.48	0.063
1996	0.217	4.96	0.13
1997	0.00091	9.35	0.3634
1998	0.175	4.81	0.1541
1999	1.119	5.35	0.0703
2000	0.867	4.38	0.1139
2001	0.495	3.79	0.1179
2002	0.581	5.12	0.0654
2003	0.323	4.06	0.1439
2004	0.76	38.86	0.0056
2005	0.95	21.47	0.009
2006	0.386	45.76	0.0067

**Table 9. Catch Per Unit Effort (Mean Catch per Trip)  
For NY Commercial Fishery, 2011**

<b>Gear</b>	<b>CPUE</b>	<b>Average Weight/Trip</b>		<b>Number of Trips</b>
	<b>Mean Catch/Trip</b>	<b>Mean (lbs)</b>	<b>StDev (lbs)</b>	<b>N</b>
Gill Net	45.2	445.1	540.5	909
Hook and Line	16.2	157.9	192.7	2,406
Otter Trawl	9.4	96.6	113.3	537
Trap or Pound Net	9.0	73.6	182.1	248
All Gear Combined	21.3	208.5	326.9	4,100

**Table 10 Hudson River bycatch of striped bass reported\* in the bait (primarily river herring) gill net fishery.**

Year	Number**
1980	
1981	
1982	
1983	
1984	
1985	
1986	
1987	
1988	
1989	
1990	
1991	
1992	
1993	
1994	
1995	23
1996	36
1997	92
1998	148
1999	235
2000	1051
2001	721
2002	787
2003	277
2004	308
2005	382
2006	722
2007	640
2008	396
2009	311
2010	304
2011^	241

\* Reporting rate unknown

\*\* weight unknown

^ Draft, data in QA/QC

**Table 11 A. 2011 ALS New York State Total Length by Wave (Unadjusted)**

TL (In))	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Total
12	0	0	0	0	2	0	2
13	0	6	21	2	2	5	36
14	0	3	36	6	19	10	74
15	0	2	47	2	18	18	87
16	0	7	48	9	22	23	109
17	0	12	69	6	33	35	155
18	0	15	53	6	32	25	131
19	0	11	63	7	22	49	152
20	0	7	52	21	19	26	125
21	0	5	43	12	12	21	93
22	0	0	0	0	0	0	0
23	0	2	30	6	21	11	70
24	0	2	19	7	11	16	55
25	0	2	11	5	15	8	41
26	0	2	15	10	13	12	52
27	0	1	11	5	9	10	36
28	0	1	11	5	14	3	34
29	0	0	10	0	8	3	21
30	0	1	15	3	5	5	29
31	0	1	9	0	1	1	12
32	0	0	15	3	6	0	24
33	0	0	8	0	4	1	13
34	0	0	9	4	3	2	18
35	0	0	7	2	1	0	10
36	0	1	5	0	0	0	6
37	0	0	3	0	0	0	3
38	0	0	0	0	0	0	0
39	0	0	3	0	1	1	5
40	0	0	7	1	1	0	9
41	0	0	4	0	0	0	4
42	0	0	4	0	0	0	4
43	0	0	4	0	0	1	5
44	0	0	0	0	1	0	1
45	0	0	4	0	0	0	4
<b>Grand Total</b>	0	81	636	122	295	286	1420



**Table 12. 2011 New York State Adjusted ALS Sample Total Length Frequency by Wave**

TI (inches)	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Grand Total
12	0	0	0	0	2	0	2
13	0	6	20	2	2	5	34
14	0	3	34	6	18	9	70
15	0	2	44	2	17	17	82
16	0	7	45	8	21	22	103
17	0	12	65	6	31	33	146
18	0	14	50	6	30	24	124
19	0	11	59	7	21	46	143
20	0	7	49	20	18	25	118
21	0	5	40	11	11	20	88
22	0	3	34	8	16	15	77
23	0	2	28	6	20	10	66
24	0	2	18	7	10	15	52
25	0	2	10	5	14	8	39
26	0	2	14	9	12	11	49
27	0	1	10	5	9	9	34
28	0	1	10	5	13	3	32
29	0	0	9	0	8	3	20
30	0	1	14	3	5	5	27
31	0	1	8	0	1	1	11
32	0	0	14	3	6	0	23
33	0	0	8	0	4	1	12
34	0	0	8	4	3	2	17
35	0	0	7	2	1	0	9
36	0	1	5	0	0	0	6
37	0	0	3	0	0	0	3
38	0	0	3	0	0	0	4
39	0	0	3	0	1	1	5
40	0	0	7	1	1	0	8
41	0	0	4	0	0	0	4
42	0	0	4	0	0	0	4
43	0	0	4	0	0	1	5
44	0	0	0	0	1	0	1
45	0	0	4	0	0	0	4
<b>Total</b>	0	81	636	122	295	286	1420



Table 13. MRFSS Estimated TL Frequency of 2011 NY Recreational Striped Bass Harvest

TL (in)	Total (#)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	808
25	
26	
27	124
28	22,576
29	54,605
30	53,734
31	107,903
32	121,088
33	75,501
34	58,834
35	32,278
36	6,966
37	8,209
38	
39	10,324
40	6,281
41	5,224
42	5,162
43	10,635
44	11,941
45	24,006
46	
47	3,421
48	1,430
49	
50	
51	
52	995
<b>Total</b>	<b>622,045</b>

Estimated length-frequency landings using MRFSS numbers, and re-scaled MRIP length-frequencies

Table 13A. MRIP Estimated TL Frequency of 2011 NY Recreational Striped Bass Harvest

TL (in)	Total (#)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	849
25	
26	
27	156
28	24,516
29	59,227
30	58,322
31	117,062
32	131,363
33	81,950
34	63,826
35	35,001
36	7,529
37	8,939
38	
39	11,173
40	6,821
41	5,669
42	5,630
43	11,552
44	12,924
45	26,058
46	
47	3,690
48	1,523
49	
50	
51	
52	1,064
<b>Total</b>	<b>674,844</b>

Estimated length-frequency landings using MRIP numbers, and re-scaled MRIP length-frequencies

**Table 14.**

**2011 CA & WLI Age TL Key**  
**Season 1: Jan - June**  
**Portion Age at Total Length**

TL	Age															Sample Size
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14 15+	
6		0.99	0.01													233
7		0.97	0.03													129
8		0.92	0.08													88
9		0.69	0.31													35
10		0.21	0.75	0.04												24
11			1.00													16
12			0.90	0.10												10
13			0.50	0.30	0.20											10
14			0.50	0.50												4
15			0.78	0.22												9
16				0.83	0.17											6
17				0.83	0.17											12
18				0.63	0.38											24
19				0.43	0.50	0.07										14
20				0.20	0.67	0.13										15
21					0.79	0.21										19
22					0.94	0.06										16
23					0.67	0.17	0.17									6
24					0.78	0.11	0.11									9
25					0.50	0.33		0.17								6
26					0.13	0.38	0.50									8
27					0.11	0.22	0.56	0.11								9
28						0.80	0.13	0.07								15
29						0.60	0.20	0.20								10
30						0.10	0.40	0.20	0.20	0.10						10
31						0.33	0.33	0.33								15
32						0.29	0.29	0.29		0.14						7
33							0.00	0.57	0.29					0.14		7
34							0.17	0.50		0.17	0.17					6
35								0.50		0.25	0.25					4
36																0
37								0.50		0.50						2
38																0
39																0
40																0
41												1.00				1
42																0
43																0
44																0
45																0
46																0
47																0
48																0
49																0
50																0
>50																0
Total	0.00	0.60	0.11	0.06	0.10	0.02	0.05	0.02	0.03	0.00	0.01	0.00	0.00	0.00	0.00	779

**2011 CA, WLI, & TRWL Age TL Key**  
**Season 2: July - Dec**  
**Portion Age at Total Length**

TL	Age															Sample Size	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14 15+		
6	0.11	0.89														57	
7	0.02	0.97	0.01													104	
8		1.00														120	
9		0.99	0.01													97	
10		0.95	0.05													60	
11		0.81	0.19													27	
12		0.76	0.24													17	
13		0.77	0.18	0.05												22	
14		0.53	0.33	0.13												15	
15		0.22	0.67		0.11											9	
16		0.13	0.75		0.13											8	
17			0.50	0.50												10	
18			0.40	0.40	0.20											5	
19			0.50	0.50												4	
20			0.18	0.27	0.55											11	
21				0.25	0.75											12	
22				0.28	0.64	0.04	0.04									25	
23				0.20	0.72	0.08										25	
24				0.08	0.73	0.15	0.04									26	
25					0.84	0.05	0.05	0.05								19	
26					0.50	0.15	0.25	0.05	0.05	0.05						20	
27					0.46	0.00	0.31	0.23	0.05							13	
28					0.10	0.19	0.35	0.16	0.19							31	
29					0.03	0.20	0.40	0.17	0.20							35	
30							0.36	0.25	0.36	0.04						28	
31							0.15	0.27	0.35	0.15	0.04			0.04		26	
32							0.03	0.09	0.23	0.57	0.06	0.03				35	
33								0.04	0.17	0.48	0.13	0.13	0.04			23	
34								0.11	0.11	0.33	0.11	0.22	0.11			9	
35									0.13	0.50	0.25	0.13				8	
36										0.33	0.50			0.17		6	
37										0.14	0.14	0.29	0.29		0.14	7	
38												1.00				3	
39													0.50	0.50		2	
40													0.25	0.50		4	
41													0.50			2	
42														0.25	0.25	0.50	4
43																1.00	1
44																1.00	1
45																1.00	1
46																1.00	1
47																	0
48																	0
49																	0
50																	0
>50																	0
Total	0.01	0.52	0.05	0.03	0.11	0.03	0.06	0.05	0.08	0.01	0.02	0.01	0.00	0.00	0.00	0.01	933

**Table 15. MRFSS 2011 New York Striped Bass Recreational Harvest by Age**

<b>Age (yrs)</b>	<b>Total Harvest (#)</b>
0	0
1	0
2	0
3	46
4	3,326
5	15,863
6	99,968
7	106,928
8	213,166
9	37,894
10	43,767
11	27,351
12	10,245
13+	63,491
<b>Total</b>	<b>622,045</b>

Ages Based on 2011 CA/WLI/Ocean Trawl Survey Keys.  
Lengths based on re-scaled MRIP length-frequency data.  
Harvest numbers estimated by MRFSS 2011 Data.

**Table 15A. MRIP 2011 New York Striped Bass Recreational Harvest by Age**

<b>Age (yrs)</b>	<b>Total Harvest (#)</b>
0	0
1	0
2	0
3	49
4	3,595
5	17,209
6	108,477
7	116,018
8	231,277
9	41,120
10	47,481
11	29,677
12	11,104
13+	68,837
<b>Total</b>	<b>674,844</b>

Ages Based on 2011 CA/WLI/Ocean Trawl Survey Keys.  
Lengths based on re-scaled MRIP length-frequency data.  
Harvest numbers estimated by MRIP 2011 Data.

**Table 15 B. MRFSS 2011 New York Striped Bass Recreational Harvest By Weight.**

Age (yrs)	Total Harvest (#)	Mean Weight (lbs)	Total Harvest (lbs)
0			
1			
2			
3	46	4.34	201
4	3,326	6.80	22,633
5	15,863	8.21	130,266
6	99,968	9.00	899,849
7	106,928	10.04	1,073,830
8	213,166	10.85	2,313,320
9	37,894	11.94	452,326
10	43,767	12.84	562,099
11	27,351	15.61	427,017
12	10,245	17.14	175,609
13+	63,491	28.23	1,792,254
<b>Total</b>	<b>622,045</b>		<b>7,849,403</b>

Average weight calculated from Ln-transformed regression of 2011 Ocean Trawl Data.  
 Total Harvest (lbs) calculated from 2011 MRFSS reported weight.

**Table 15 C. MRIP 2011 New York Striped Bass Recreational Harvest By Weight.**

Age (yrs)	Total Harvest (#)	Mean Weight (lbs)	Total Harvest (lbs)
0			
1			
2			
3	49	4.57	222
4	3,595	7.18	25,826
5	17,209	8.65	148,893
6	108,477	9.48	1,028,667
7	116,018	10.58	1,227,446
8	231,277	11.43	2,644,146
9	41,120	12.58	517,113
10	47,481	13.53	642,447
11	29,677	16.45	488,162
12	11,104	18.06	200,554
13+	68,837	29.73	2,046,287
<b>Total</b>	<b>674,844</b>		<b>8,969,762</b>

Average weight calculated from Ln-transformed regression of 2011 Ocean Trawl Data.  
 Total Harvest (lbs) calculated from 2011 MRIP reported weight.

Table 16. MRFSS 2011 Total Length Frequency of New York Striped Bass Recreational Bycatch Mortality

TL (in)	Total (#)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	164
13	2,951
14	6,057
15	7,124
16	8,926
17	12,704
18	10,743
19	12,458
20	10,222
21	7,608
22	6,669
23	5,730
24	4,502
25	3,358
26	4,253
27	2,946
28	2,782
29	1,720
30	2,372
31	982
32	1,960
33	1,064
34	1,469
35	815
36	492
37	245
38	245
39	409
40	735
41	327
42	327
43	409
44	82
45	327
<b>Total Bycatch</b>	<b>123,176</b>

Lengths based on 2011 ALS length frequency data for striped bass of all sizes  
 Bycatch kill estimated from 2011 MRFSS B2's (8% B2's)

Table 16A. MRIP 2011 Total Length Frequency of New York Striped Bass Recreational Bycatch Mortality

TL (in)	Total (#)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	161
13	2,886
14	5,924
15	6,968
16	8,731
17	12,426
18	10,508
19	12,186
20	9,999
21	7,442
22	6,523
23	5,605
24	4,403
25	3,285
26	4,160
27	2,882
28	2,721
29	1,683
30	2,320
31	961
32	1,918
33	1,041
34	1,437
35	798
36	481
37	240
38	240
39	400
40	719
41	320
42	320
43	400
44	80
45	320
<b>Total Bycatch</b>	<b>120,486</b>

Lengths based on 2011 ALS length frequency data for striped bass of all sizes  
 Bycatch kill estimated from 2011 MRIP B2's (8% B2's)

Table 16. MRFSS 2011 Total Length Frequency of New York Striped Bass Recreational Bycatch Mortality

TL (in)	Total (#)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	164
13	2,951
14	6,057
15	7,124
16	8,926
17	12,704
18	10,743
19	12,458
20	10,222
21	7,608
22	6,669
23	5,730
24	4,502
25	3,358
26	4,253
27	2,946
28	2,782
29	1,720
30	2,372
31	982
32	1,960
33	1,064
34	1,469
35	815
36	492
37	245
38	245
39	409
40	735
41	327
42	327
43	409
44	82
45	327
<b>Total Bycatch</b>	<b>123,176</b>

Lengths based on 2011 ALS length frequency data for striped bass of all sizes  
 Bycatch kill estimated from 2011 MRFSS B2's (8% B2's)

Table 16A. MRIP 2011 Total Length Frequency of New York Striped Bass Recreational Bycatch Mortality

TL (in)	Total (#)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	161
13	2,886
14	5,924
15	6,968
16	8,731
17	12,426
18	10,508
19	12,186
20	9,999
21	7,442
22	6,523
23	5,605
24	4,403
25	3,285
26	4,160
27	2,882
28	2,721
29	1,683
30	2,320
31	961
32	1,918
33	1,041
34	1,437
35	798
36	481
37	240
38	240
39	400
40	719
41	320
42	320
43	400
44	80
45	320
<b>Total Bycatch</b>	<b>120,486</b>

Lengths based on 2011 ALS length frequency data for striped bass of all sizes  
 Bycatch kill estimated from 2011 MRIP B2's (8% B2's)

**Table 17. 2011 MRFSS New York Striped Bass Recreational Bycatch Mortality at Age**

<b>Age (yrs)</b>	<b>Total Bycatch (#)</b>
0	
1	5,626
2	17,909
3	31,541
4	41,573
5	6,305
6	6,795
7	3,401
8	4,911
9	768
10	1,456
11	1,054
12	392
13+	1,445
<b>Total</b>	<b>123,176</b>

Ages based on CA/WLI/Ocean Trawl age-length keys  
 Lengths based on 2011 ALS length-frequency data  
 Bycatch mortality estimated by MRFSS 2011 Data (8% B2's)

**Table 17A. 2011 MRIP New York Striped Bass Recreational Bycatch Mortality at Age**

<b>Age (yrs)</b>	<b>Total Bycatch (#)</b>
0	
1	5,503
2	17,518
3	30,852
4	40,665
5	6,167
6	6,646
7	3,327
8	4,803
9	751
10	1,424
11	1,031
12	384
13+	1,414
<b>Total</b>	<b>120,486</b>

Ages based on CA/WLI/Ocean Trawl age-length keys  
 Lengths based on 2011 ALS length-frequency data  
 Bycatch mortality estimated by MRFSS 2011 Data (8% B2's)

**Table 17B. MRFSS 2011 New York Striped Bass Recreational Bycatch Mortality by Weight**

Age (yrs)	Total Bycatch (#)	Mean Weight (lbs)	Total Weight (lbs)
0			
1	5,626	0.88	4,975
2	17,909	1.34	23,995
3	31,541	1.94	61,161
4	41,573	3.27	135,736
5	6,305	4.44	27,968
6	6,795	7.29	49,533
7	3,401	8.80	29,917
8	4,911	10.83	53,168
9	768	13.91	10,683
10	1,456	15.90	23,153
11	1,054	19.00	20,026
12	392	20.08	7,877
13+	1,445	26.81	38,745
<b>Total</b>	<b>123,176</b>		<b>486,936</b>

Ages based on CA/WLI/Ocean Trawl age-length keys  
 Bycatch mortality estimated by MRFSS 2011 Data (8% B2's)  
 Average weight calculated from Ln-transformed regression of 2011 Ocean Trawl Survey data

**Table 17C. MRIP 2011 New York Striped Bass Recreational Bycatch Mortality by Weight**

Age (yrs)	Total Bycatch (#)	Mean Weight (lbs)	Total Weight (lbs)
0			
1	5,503	0.88	4,867
2	17,518	1.34	23,471
3	30,852	1.94	59,826
4	40,665	3.27	132,772
5	6,167	4.44	27,358
6	6,646	7.29	48,451
7	3,327	8.80	29,264
8	4,803	10.83	52,007
9	751	13.91	10,449
10	1,424	15.90	22,647
11	1,031	19.00	19,588
12	384	20.08	7,705
13+	1,414	26.81	37,898
<b>Total</b>	<b>120,486</b>		<b>476,302</b>

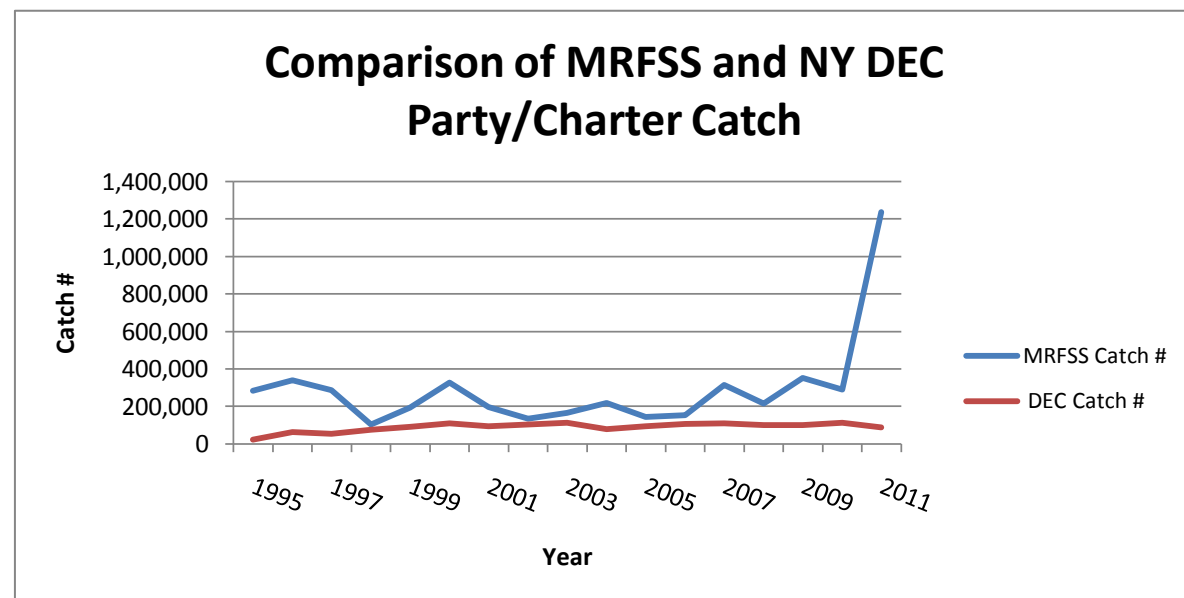
Ages based on CA/WLI/Ocean Trawl age-length keys  
 Bycatch mortality estimated by MRFSS 2011 Data (8% B2's)  
 Average weight calculated from Ln-transformed regression of 2011 Ocean Trawl Survey data



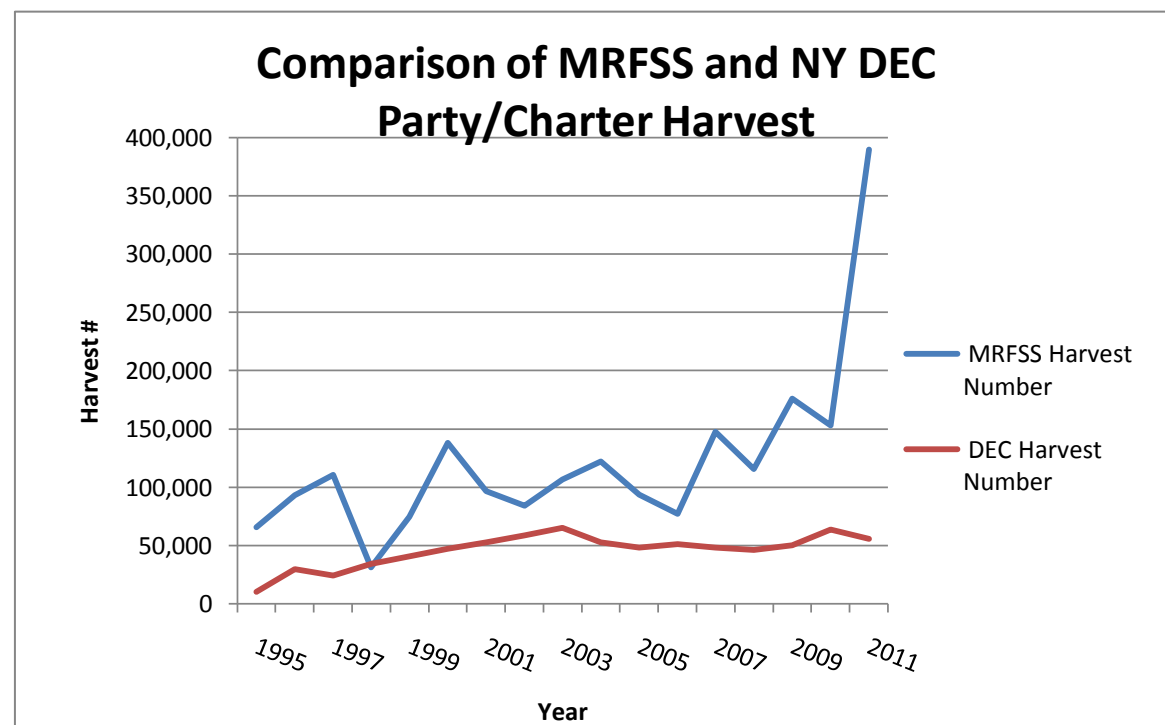
**Table 18 Comparison of MRFSS and NY DEC Party/Charter Boat Permit Trip Report Data**

MRFSS Party and Charter Boats					NY Party/Charter Boat Trip Reports				
Year	MRFSS Harvest Number	Harvest Pounds	Harvest Mean Wt.	Total MRFSS Catch #	DEC Harvest Number	Harvest Pounds	Harvest Mean Wt.	Total DEC Catch #	Angler Trips
1995	65,589	1,512,422	23.1	284,522	10,268	165,493	16	23,531	10,605
1996	93,358	2,160,667	23.1	340,272	29,741	378,581	13	63,086	30,361
1997	110,718	2,110,779	19.1	287,764	24,527	399,289	16	53,662	26,765
1998	31,256	531,584	17	102,526	34,242	553,556	16	75,689	37,502
1999	74,712	1,182,484	15.8	191,681	41,030	636,187	16	91,080	42,307
2000	137,982	2,131,396	15.4	326,269	47,096	723,866	15	107,837	51,689
2001	96,537	1,794,679	18.6	196,540	52,568	762,734	15	95,010	56,297
2002	84,023	1,217,387	14.5	133,172	58,871	913,704	16	104,267	61,052
2003	106,622	548,125	5.1	164,065	65,118	1,055,922	16	111,717	69,361
2004	121,878	817,741	6.7	217,041	52,649	895,033	17	77,949	58,408
2005	93,659	1,332,233	14.2	144,267	48,332	804,869	17	92,476	63,063
2006	77,004	1,194,102	15.5	154,315	51,054	859,530	17	105,561	70,239
2007	147,726	2,220,696	15	313,303	48,493	802,089	16.5	108,116	74,678
2008	115,791	1,640,251	14.2	216,425	46,432	787,882	17	100,583	67,458
2009	176,060	2,350,434	13.4	350,606	50,131	797,083	15.9	98,470	72,416
2010	153,279	2,133,345	13.9	290,399	63,888	971,098	15.2	113,719	81,209
2011	389,438	5,157,178	13.2	1,235,940	55,587	832,137	15	87,137	72,585

2011 MRIP estimate



**Figure 4. Comparison of MRFSS and NYS DEC Party/Charter Catch Reports, 1995 - 2011.**



**Figure 4a. Comparison of MRFSS and NYS DEC Party/Charter Harvest Reports, 1995 - 2011.**

<b>Table 19A. MRFSS Estimates of Striped Bass Harvest and Losses in New York for 2011.</b>			
Category	Number	Total Weight	Average Weight
<b>Legal Commercial Harvest</b>	87,349	854,731	9.79
<b>Commercial Bycatch</b>			
Coastal Gill Nets, Open Season	282	902	3.20
Coastal Gill Nets, Closed Season+			
Pound Nets, Open Season	3	6	2.00
Pound Nets, closed Season+			
Hook and Line, Open Season	382	1,910	5.00
Trawls, Open Season	119	381	3.20
<b>Recreational Fishery</b>			
Legal Recreational Harvest, Hudson River+			
Legal Recreational Harvest, Coastal Waters	622,045	7,849,403	12.62
<b>Recreational Bycatch</b>			
Catch and Release Mortality, Hudson River +			
Poaching, Hudson+			
Catch and Release Mortality, Coastal	123,176	486,936	3.95
Poaching, Coastal +			
<b>Sum</b>	833,356	9,194,269	
Hudson River Shad Net Fishery closed in 2010.			
"+" - n/a, not available"			

<b>Table 19A. MRIP Estimates of Striped Bass Harvest and Losses in New York for 2011.</b>			
Category	Number	Total Weight	Average Weight
<b>Legal Commercial Harvest</b>	87,349	854,731	9.79
<b>Commercial Bycatch</b>			
Coastal Gill Nets, Open Season	282	902	3.20
Coastal Gill Nets, Closed Season+			
Pound Nets, Open Season	3	6	2.00
Pound Nets, closed Season+			
Hook and Line, Open Season	382	1,910	5.00
Trawls, Open Season	119	381	3.20
<b>Recreational Fishery</b>			
Legal Recreational Harvest, Hudson River+			
Legal Recreational Harvest, Coastal Waters	674,844	8,969,762	13.29
<b>Recreational Bycatch</b>			
Catch and Release Mortality, Hudson River +			
Poaching, Hudson+			
Catch and Release Mortality, Coastal	120,486	476,302	3.95
Poaching, Coastal +			
<b>Sum</b>	883,465	10,303,994	
Hudson River Shad Net Fishery closed in 2010.			
"+" - n/a, not available"			

**Table 20. Hudson River Index of Relative Abundance  
YOY Striped Bass from 1979 - 2011.**

6 week Index (includes sampling weeks 4 - 9 )					9 week Index (includes sampling weeks 1 - 9 )				
Year	# Seines	YOY GM	LCI	UCI	Year	# Seines	YOY GM	LCI	UCI
1979	117	2.15	1.59	2.84	1979				
1980	150	6.10	4.53	8.11	1980				
1981	132	8.71	6.81	11.08	1981				
1982	143	14.13	11.32	17.57	1982				
1983	147	16.59	12.85	21.33	1983				
1984	146	15.00	12.03	18.65	1984				
1985	146	1.85	1.42	2.36	1985	216	2.15	1.73	2.62
1986	145	2.84	2.21	3.59	1986	217	4.19	3.45	5.05
1987	150	15.90	11.98	21.01	1987	225	25.12	20.09	31.34
1988	145	33.46	27.89	40.10	1988	220	42.16	36.33	48.89
1989	150	21.35	17.23	26.41	1989	225	28.42	23.79	33.92
1990	142	19.08	15.31	23.72	1990	217	29.8	24.9	35.63
1991	139	3.55	2.80	4.45	1991	214	6.52	5.32	7.95
1992	146	11.43	9.62	13.55	1992	221	16.93	14.67	19.52
1993	150	12.59	10.08	15.67	1993	225	23.32	19.13	28.38
1994	144	18.01	15.08	21.47	1994	218	26.06	22.43	30.26
1995	147	16.23	13.72	19.16	1995	220	20.08	17.46	23.07
1996	133	8.96	7.42	10.77	1996	203	12.8	10.97	14.92
1997	135	22.10	17.17	28.36	1997	187	27.41	22.26	33.69
1998	127	13.47	10.95	16.53	1998	196	19.29	16.26	22.85
1999	102	26.03	20.60	32.83	1999	170	33.22	28.09	39.25
2000	134	3.15	2.42	4.04	2000	209	7.21	5.76	8.98
2001	135	22.97	16.94	31.01	2001	208	26.36	21.22	32.7
2002	137	12.26	10.07	14.88	2002	209	13.23	11.37	15.36
2003	146	17.62	13.99	22.13	2003	220	32.17	26.39	39.17
2004	144	8.97	7.45	10.76	2004	218	9.95	8.54	11.57
2005	148	8.48	6.34	11.25	2005	220	10.39	8.31	12.94
2006	148	3.82	3.02	4.78	2006	221	4.84	4.02	5.79
2007	147	35.02	28.59	42.84	2007	221	39.56	33.72	46.37
2008	138	13.80	11.17	16.99	2008	212	16.48	14.05	19.3
2009	148	9.73	7.70	12.23	2009	196	12.79	10.48	15.56
2010	144	12.90	10.48	15.83	2010	216	23.43	19.37	28.29
2011	117	7.3	5.65	9.36	2011	182	12.23	9.95	14.99
<b>1979-2009 Average</b>		13.72			<b>1985-2011 Average</b>		19.49		
<b>25th percentile</b>		8.60							
<b>1979-2011 Average</b>		13.50							
<b>25th percentile</b>		8.48							

**Table 21. Western Long Island Index of Relative Abundance  
Yearling Striped Bass from 1985 - 2011.**

Year	#Seines	YRL GM	LCI	UCI
1985	42	0.61	0.24	1.09
1986	80	0.30	0.15	0.47
1987	109	0.21	0.09	0.34
1988	83	0.81	0.45	1.27
1989	80	1.78	1.16	2.58
1990	92	0.37	0.21	0.55
1991	111	1.26	0.84	1.78
1992	91	1.34	0.90	1.89
1993	108	0.75	0.48	1.06
1994	96	1.43	0.89	2.13
1995	81	1.29	0.85	1.83
1996	79	1.54	0.96	2.30
1997	58	1.00	0.58	1.53
1998	54	2.10	1.27	3.23
1999	88	2.05	1.45	2.80
2000	102	1.56	0.99	2.30
2001	83	2.16	1.51	2.96
2002	96	2.53	1.86	3.37
2003	107	1.19	0.88	1.56
2004	99	2.41	1.76	3.20
2005	75	0.64	0.36	0.99
2006	85	2.02	1.39	2.80
2007	95	0.58	0.35	0.85
2008	97	1.24	0.84	1.74
2009	89	0.33	0.20	0.48
2010	87	0.45	0.28	0.65
2011	98	2	1.73	2.29
Average		1.26		

Table 22. Western Long Island Index of Relative Abundance (Geometric Mean) YOY Striped Bass, 1984 - 2011

YEAR	July through October <sup>+</sup>				July through August				August			
	SEINES*	GM (fish/haul)	LCI**	UCI	SEINES*	GM (fish/haul)	LCI**	UCI	SEINES*	GM (fish/haul)	LCI**	UCI
1984	25	0.0			25	0.0			14	0.0		
1985	4	0.0			4	0.0			4	0.0		
1986	21	0.0			21	0.0			5	0.0		
1987	33	0.1	0.0	0.3	26	0.1	0.0	0.3	9	0.3	0.0	0.9
1988	21	0.9	0.1	2.2	11	1.8	0.2	5.7	4	2.5	0.0	27.4
1989	34	0.4	0.1	0.8	19	0.8	0.2	1.7	12	1.6	0.6	3.2
1990	23	0.2	0.0	0.5	19	0.2	0.0	0.6	7	0.8	0.0	2.3
1991	18	2.8	1.2	5.6	18	2.8	1.2	5.6	7	3.7	0.5	13.5
1992	29	3.4	2.0	5.4	14	3.1	1.2	6.6	7	3.7	0.7	12.3
1993	23	3.0	1.4	5.7	23	3.0	1.4	5.7	8	14.1	5.1	36.3
1994	30	0.5	0.1	1.0	18	0.5	0.0	1.3	7	2.0	0.4	5.4
1995	14	0.6	0.1	1.3	14	0.6	0.1	1.3	8	1.2	0.3	2.9
1996	26	2.4	1.2	4.3	13	3.7	1.6	7.7	3	34.8	14.7	80.7
1997	22	2.8	1.2	5.6	7	0.1	0.0	0.3	3	0.3	0.0	0.8
1998	30	2.4	1.1	4.4	13	3.2	0.8	9.1	6	21.8	8.7	52.9
1999	23	7.9	4.1	14.6	15	20.7	10.6	39.6	4	44.7	11.4	167.2
2000	45	30.3	16.6	54.8	25	120.4	59.5	242.7	10	51.1	26.4	98.0
2001	41	11.3	6.7	18.7	18	44.3	22.7	85.7	10	18.3	8.6	37.7
2002	35	1.6	0.9	2.4	17	2.2	1.0	3.9	8	2.0	0.8	4.0
2003	45	3.6	2.4	5.2	25	3.9	2.2	6.5	10	4.5	2.3	8.1
2004	50	0.4	0.1	0.7	30	0.4	0.0	0.9	10	0.2	0.1	0.3
2005	45	2.4	1.5	3.8	20	3.0	1.3	6.0	10	4.8	1.5	12.5
2006	46	0.7	0.3	1.3	23	1.1	0.3	2.5	12	3.0	0.8	7.6
2007	48	5.9	3.9	8.6	24	8.3	4.8	14.1	12	9.4	4.1	20.0
2008	52	0.0	0.0	0.1	28	0.0			12	0.0		
2009	48	0.2	0.1	0.4	24	0.2	0.0	0.3	12	0.1	0.0	0.5
2010	46	4.43	3.01	6.36	24	8.19	5.24	12.52	18	7.34	4.53	11.56
2011	48	0.83	0.43	1.36	24	0.60	0.18	1.17	12	0.77	0.06	1.95

+ Used in comparison to the Hudson River YOY Striped Bass Abundance Index

\* 200' seine hauls only, Little Neck and Manhasset Bays

\*\* if LCI < 0 then LCI was set to 0

Table 23 Length-frequency of the striped bass spawning stock collected by haul seine in the Hudson River Estuary 1985-2011. No data collected in 2002.

Total Length	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
<b>Male</b>																												
<300			1																			1	2	1	1	1	3	
300-319			1																									
320-339				1																								
340-359																												
360-379			3		4		1	4		2	1	3	1	2	1						1	3	3	1		1	1	
380-399	3	4		6	4	4	4	10	2	3	4	4	1	4	1	1	4				3	8	6	7	1	1	2	
400-419	6	5	10	7	2	3	6	17	11	6	5	5	2	6	4	5	11				7	12	11	3	3	10	2	
420-439	5	10	6	23	15	2	5	26	3	2	6	3	2	11	3	6	12				3	28	14	9	8	20	3	
440-459	6	7	9	22	6	6	13	17	15	7	10	8	2	11	3	6	12				5	16	16	4	13	13	5	
460-479	6	16	23	31	9	3	7	9	10	7	11	4	1	5	2	5	9				5	13	15	10	13	11	8	
480-499	4	9	23	38	14	5	24	4	7	8	7	1	8	6	4	6				5	17	22	9	14	14	11	15	
500-519	1	8	34	47	18	5	5	26	11	7	10	4		10	5	8	4				17	21	27	9	19	15	9	
520-539	6	9	48	33	21	8	8	24	7	8	7	7	2	10	6	10	5				21	14	36	11	18	18	9	
540-559	3	12	44	39	15	7	6	39	11	5	15	5	2	8	5	11	6				17	18	32	19	15	20	14	
560-579	3	5	46	61	29	4	10	27	20	6	9	5	2	6	7	5	5				23	18	32	25	18	17	6	
580-599	2	7	41	58	36	10	7	28	15	3	14	8	2	7	4	10	10				17	24	28	28	23	13	10	
600-619	4	10	24	53	27	12	1	28	16	6	11	20	5	3	3	14	5				14	20	38	23	21	23	8	
620-639	5	11	29	60	28	11	4	21	11	13	14	20	1	3	5	8	3				9	17	26	32	19	22	6	
640-659	2	8	34	64	33	8	7	24	10	7	11	10	3	2	1	7	12				8	20	35	22	22	20	10	
660-679	3	9	17	41	20	9	5	26	10	11	18	21	3	8	5	5	8				12	18	31	18	15	27	10	
680-699	1	3	17	28	22	9	5	22	10	13	7	29	3	5	3	3	15				18	19	33	9	17	20	10	
700-719	1	6	13	24	20	6	7	19	9	16	10	24	2	7	3	5	10				17	22	32	21	14	17	14	
720-739	1	3	10	8	13	12	10	25	16	12	17	20	2	6	5	1	7				13	15	30	16	11	14	7	
740-759			4	13	12	6	8	29	15	8	8	32	3	4		6	6				13	16	31	14	10	8	13	
760-779	1		9	10	7	11	3	24	10	4	11	28	2	3	9	4	6				17	12	27	9	13	13	12	
780-799	1		5	6	3	5	4	16	10	3	10	19	2	7	8	2	9				13	17	27	9	9	8	6	
800-819			4	4	1	6	3	21	11	8	16	13		1	5	4	11				9	10	26	7	7	2	6	
820-839			2	3	1	1	3	18	13	6	6	15	1	4	2	6	11				3	9	12	5	3	3	3	
840-859			2	3	1	1	6	12	7	8	2	10		2	2	2	7				8	9	10	2	3	5	3	
860-879			2	5	2	1	3	11	9	4	5	12	2	2	1	2	7				3	8	7	4	3	3	2	
880-899			1	2	2	2	2	4	3	1		4		2	2	4					5	5	10	3		1	7	
900-919			2	2	1			6	1	4	5	5		1	1	8					3	4	9	1	2	1	2	
920-939			2	2	2	2	2	4		2	4	5		2	1	5					2	5	3	1	1	1	1	
940-959			2	1	3		2	1	3	1	2		1		1	2					4	2		1	1	1	1	
960-979				1				1	1					1	1	1					2	4	3	2		2		
980-999								1	1	1						3					2	1	4		1	1	1	
1000-1019	1																					1					1	
1020-1039																						1		1				
1040-1059				1																		1	1	1				
1060-1079																												
1080-1099										1																		
1100-1119			1																									
1120-1139																												
1140-1159																												
1160-1179																												
1180-1199																												
>1200																												
Total	66	144	467	692	367	159	150	565	273	194	257	353	47	154	99	142	235	298	429	642	338	315	345	195	282	76		

Table 23 Length-frequency of the striped bass spawning stock collected by haul seine in the Hudson River Estuary 1985-2011. No data collected in 2002.

Total Length	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
<b>Female</b>																												
<300																												
300-319																												
320-339																												
340-359																												
360-379																												
380-399																												
400-419																												
420-439																												
440-459																												
460-479	2																											
480-499	2																											
500-519																												
520-539	3																											
540-559																												
560-579		1	2		1	1		1	1	1	1	1	1															
580-599	2	1	5	3		1																						
600-619	3	3	5	2	3	1	2			1													1	2				
620-639	1	1	5	5	3	2	2	2																4	1	2	1	
640-659	1	2	3	11	8	4	2	2	1	1	1												1	1	1	1	1	
660-679	3	7	8	9	2					3	1												2	1	2		1	3
680-699	1	2	11	10	18	4	2			1	2	1											3	4	2	1	1	7
700-719	6	21	22	21	5	5	2	2	2	2	2												3	1	1	5	2	2
720-739	1	4	13	21	28	17	2	5	1	3	3	1											2	2	2	6	3	2
740-759	3	1	23	22	26	11	5	4		3	11	7	6	2	1	3	3						5	12	7	8	9	
760-779	3	1	18	27	28	24	11	9	5	10	6	10	4	7	5	4	2						6	11	16	31	11	
780-799	1	2	22	28	19	23	12	21	4	14	14	15	2	17	7	6	4						23	22</				

**Table 24 Age structure (number at age) of striped bass spawning stock collected by haul seine in the Hudson River Estuary.**

\* Age structure for 1996 - 1999, 2003-11 estimated using a length-age key.

No data collected in 2002.

FEMALE																				
Year	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1985			2	5	11	2	4	2	1											27
1986				4	3	8	6	5	1											27
1987				11	61	68	38	33	21	10	7	5	2	2		1			1	260
1988				7	29	119	73	21	23	12		7	1	2	1					295
1989				6	68	70	93	59	20	19	5	2	2	2						346
1990				1	29	69	68	57	32	8	4	1	2							271
1991					1	29	46	43	27	12	5	4		1						168
1992			1	2	6	30	117	115	66	39	18	2	2	1						399
1993				4	4	9	29	54	42	30	11	2		1						186
1994				1	3	28	29	39	64	29	11	6	1							211
1995					5	26	53	25	17	29	12	8	2	2						179
1996			0	1	10	33	50	48	34	20	6	3	1	1	0					207
1997					2	5	22	13	8	7	3	5	2	1						68
1998				0	7	28	47	53	44	29	13	7	1	3	0	0				233
1999				0	4	20	35	37	32	20	8	4	1	1	0	0				162
2000			0	1	6	22	40	41	32	19	7	3	1	1	0					174
2001				1	5	11	17	19	19	12	6	3	1	2	0	0				97
2002																				0
2003				1	10	38	53	50	45	29	13	7	3	4	0	0			0	255
2004				1	12	41	56	48	39	26	10	6	1	1	0	0				241
2005				1	11	34	47	41	32	21	8	4	1	1	0	0				201
2006				4	24	69	99	90	65	40	15	8	2	3	0	0				420
2007			0	2	14	53	84	67	44	24	10	5	2	1	0	0			0	306
2008			0	5	35	76	74	44	25	14	5	3	2	1	0					283
2009				1	13	48	83	83	62	34	12	5	1	2	0					345
2010				2	13	37	56	52	40	25	9	5	1	1	0	0				240
2011				1	9	26	33	30	22	14	5	3	2	1	0	0			0	146

MALE																				
Year	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1985		5	20	17	13	17	7	1	2	2		1		1						86
1986		22	37	36	26	12	4	4	2							1				144
1987	1	11	118	107	95	62	27	27	12	3		1								464
1988		6	113	246	119	98	50	16	23	5	2									678
1989		13	23	73	110	53	41	20	8	7				1						349
1990		11	19	7	35	38	15	15	8	3										151
1991		23	37	7	4	24	21	10	14	7		1								148
1992		17	114	115	41	24	72	63	37	20	12	3								518
1993		12	23	58	51	21	21	33	27	8	7			1						262
1994		6	20	18	31	41	14	20	9	10	4	1								174
1995		6	41	53	32	31	26	19	7	3	8	2								228
1996		9	25	45	51	57	53	51	36	17	8	2		0						353
1997		8	3	5	9	7	5	5	2		1									45
1998		8	44	53	48	43	34	30	20	9	6	2		1						297
1999		4	16	18	14	13	12	11	7	2	2	0		0						99
2000		6	26	33	23	17	13	11	7	3	2	0		0						142
2001		17	37	36	28	24	26	27	20	11	7	2		0						235
2002																				0
2003		8	44	53	48	43	34	30	20	9	6	2		1						296
2004		23	73	83	63	52	42	38	28	15	10	2		1						429
2005		19	90	118	103	89	75	65	42	20	12	3		1						639
2006		11	47	78	60	50	35	26	17	7	5	1		0						336
2007		10	51	73	58	44	31	23	15	6	2	0		0						314
2008		19	67	81	61	43	29	21	13	6	3	0		0						344
2009		6	29	36	32	29	23	19	12	6	2	1		0						194
2010		11	50	61	48	37	28	23	15	6	2	0		0						281
2011		3	14	16	13	9	6	5	4	2	1	0		0						73



**Table 25. 2011 Age Frequency of Adult Coastal Striped Bass Stocks Captured by Ocean Trawl During the Fall**

Age	Year Class	Frequency	% Frequency
1	2010	0	0.00
2	2009	0	0.00
3	2008	2	1.69
4	2007	13	11.02
5	2006	11	9.32
6	2005	23	19.49
7	2004	18	15.25
8	2003	38	32.20
9	2002	3	2.54
10	2001	7	5.93
11	2000	3	2.54
12	1999	0	0.00
13	1998	0	0.00
14	1997	0	0.00
15	1996	0	0.00
>15		0	0.00
<b>Total</b>		<b>118</b>	<b>100.00</b>

Total tows = 27.

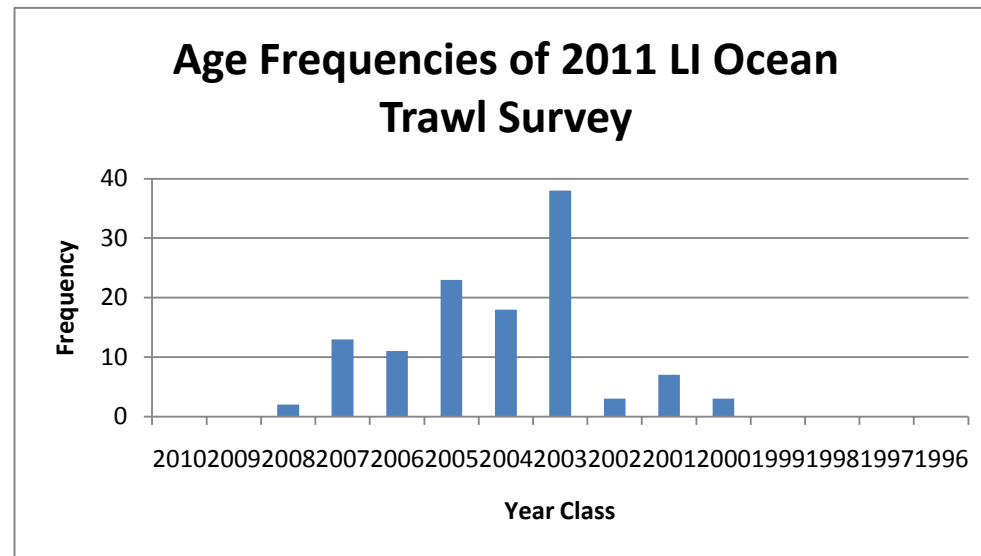


Figure 5. 2011 NY Ocean Trawl Survey Age Frequencies.

**Table 26. Date Standard Geometric Mean Catch at Age  
from the New York Ocean Haul Seine Survey 1987 - 2006, and Ocean Trawl Survey 2007 - 2011.**

Year	Age						
	2	3	4	5	6	7	8+
1987	1.13	6.93	12.77	9.91	3.14	1.24	0.40
1988	6.41	7.64	5.53	4.72	2.42	0.62	0.93
1989	1.86	2.73	1.50	1.62	1.04	0.95	0.40
1990	1.89	9.19	9.52	3.54	3.06	1.73	1.85
1991	5.23	9.26	6.16	1.31	0.42	0.64	2.27
1992	1.49	7.84	4.85	2.28	0.62	0.27	1.68
1993	3.81	9.43	7.09	1.71	0.80	0.23	1.24
1994	2.22	4.26	2.46	2.12	1.31	0.86	2.56
1995	3.20	3.52	3.32	0.94	0.86	0.46	0.69
1996	11.75	105.61	16.13	4.64	1.33	1.03	0.64
1997	20.24	23.79	44.23	6.56	1.81	0.36	1.04
1998	19.60	31.02	17.91	29.83	3.82	0.95	1.31
1999	1.97	17.75	4.87	1.68	1.24	0.14	0.50
2000	7.79	11.81	26.54	9.43	2.23	2.25	0.80
2001	1.49	12.94	4.19	6.05	2.09	0.78	0.87
2002	7.33	5.14	4.19	1.83	1.67	1.30	1.10
2003	11.51	20.76	7.12	5.25	2.31	3.68	8.35
2004	5.46	62.09	29.79	6.84	2.42	0.83	1.44
2005	9.72	5.09	16.41	5.45	1.34	0.55	0.93
2006	3.90	38.77	4.44	9.81	2.59	0.88	0.55
2007*	0.23	1.52	8.87	2.94	4.46	1.34	1.20
2008*		0.41	2.05	5.18	0.76	0.61	0.61
2009*	0.15	0.26	0.78	0.35	0.68	0.27	0.73
2010*	0.02	0.44	0.68	1.35	1.51	1.73	0.69
2011*		0.06	0.44	0.36	0.75	0.59	1.73

\*From 2007 - 2011, Ocean Trawl Surveys were conducted, instead of Ocean Haul Seine Surveys.  
Updated 2007 data.

***STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION***

**DIVISION OF FISH & WILDLIFE**

Striped Bass Fisheries Management Measures,  
Harvest and Resource Monitoring: 2011  
&  
Striped Bass Management Programs: 2011

June 2012

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Submitted to the Atlantic States Marine Fisheries Commission as a  
requirement to the Interstate Fishery Management Plan for Striped Bass

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In accordance with the Interstate Fisheries Management Plan for Atlantic Striped Bass (Plan), the State of New Jersey's Division of Fish and Wildlife (Division) herein submits its annual report on striped bass fishery dependent and independent monitoring programs conducted with state waters during 2011, as well as anticipated management measures for 2012.

## **I. FISHERY DEPENDENT MONITORING**

### **A. Commercial Fishery (Striped Bass Bonus Program)**

Since there is no netting and no sale of striped bass in New Jersey, the commercial allocation forms the basis of the Striped Bass Bonus Program (SBBP). The quota for 2011, allocated by the Atlantic States Marine Fisheries Commission (ASMFC), was 321,750 pounds.

#### **1. Characterization of Fishery**

As defined by regulation, recreational anglers intending to take one striped bass measuring not less than 28 inches in length in addition to the normal possession limit (see section IB1, p.6) had to apply on-line to the Division for a "fish possession permit". Applicants receive one non-transferable permit to be filled out immediately upon capture of the bonus fish. The used permit and harvest information is then reported on-line and anglers are eligible to obtain an additional permit if available.

#### **2. Characterization of Catch and Harvest**

The SBBP accounted for 916 fish harvested during the 2011 calendar year for a cumulative weight of 16,332 pounds. This represents a total harvest of 5.1% of the 2011 quota allocation (Table 1). Total lengths of fish harvested ranged from 28 to 50 inches with a mean of 34.0 inches (Figure 1). The weight of harvested fish ranged from 5 to 60 pounds with a mean of 17.8 pounds (Figure 2). There were 215 striped bass aged from the SBBP, ranging from age 4 to 18 (Table 2). Due to changes in the administration of the SBBP over the last few years, the 2011 harvest continues a trend of harvests that are well below the long-term average but steadily increasing since 2007.

#### **3. Characterization of Other Losses**

The New Jersey American shad commercial gill net fishery takes place primarily during the months of March and April. This period coincides with the presence of large concentrations of striped bass migrating along the coast and in Delaware Bay. Most commercial shad nets for the directed fishery in Delaware Bay are 5.5" to 6" stretch mesh. Striped bass bycatch mortality has been a resource and management problem for many years although this has been tempered somewhat with the closure of the directed shad fishery in ocean waters and the attrition of shad fishers within Delaware Bay.

Reliable estimates on striped bass bycatch mortality were calculated for 2000 through 2011 (Table 3 and previous reports). Data were derived from mandatory American shad commercial fishery logbooks that included directed fisheries within Delaware Bay as well bycatch fisheries in New Jersey's coastal areas. Prior to 2000, the Division utilized the National Marine Fisheries Service (NMFS) annual American shad landings data for all non-harvest loss calculations.

Commercial fishers accounted for 12,084 pounds of American shad landings in 2011. The percentage of drift gear versus fixed gear was 51.4% and 48.5%, respectively. Mortality rates of striped bass in drift gear (2.3 %) and fixed gear (11.6 %) were also developed from the 2011 logbooks. Mortality rates were multiplied by the reported number of striped bass caught by commercial shad fishers to estimate the total striped bass mortality in numbers. Total striped bass mortality was multiplied by the 2011 mean weight of striped bass calculated from field

investigations in Delaware Bay (8.87 pounds) resulting in a non-harvest loss estimate of 4,379 pounds.

Information regarding length and age frequencies of striped bass representative of the bycatch in the American shad commercial fishery can be found in section IIB2, Table 13 and Figure 10. Striped bass biological characterization from the Delaware Bay Tagging Program (DBTP) is similar in terms of season and gear as that of the American shad commercial fishery.

## **B. Recreational Fishery**

### **1. Characterization of Fishery**

New Jersey striped bass management is governed primarily by statute. The current recreational management measures were signed into law (N.J.S.A 23:5-45-1) in 2006 to comply with Amendment #6 to the Plan. Another important piece of legislation was the inclusion of a prohibition on the sale of striped bass in 1991. The following were New Jersey's striped bass management measures for 2011:

Size Limits:	Effective January 1, 2009 through December 31, 2011 2 fish greater than or equal to 28 inches
Possession Limit:	2 striped bass – all waters
Closed Seasons:	January and February in all intra-coastal waters; April and May in the lower Delaware River (Spawning ground closure)
Gear Restrictions:	Anglers fishing with natural bait in the Delaware River are required to use non-offset circle hooks from April 1 through May 31

### **2. Characterization of Catch and Harvest**

Recreational fishery catch statistics obtained (queried 6/11/12) from the Marine Recreational Information Program (MRIP) for 2011 include:

Total Catch (number):	1,277,206 striped bass	PSE – 14.5
Total Harvest (number):	393,193 striped bass	PSE – 16.2
Total Harvest (weight):	6,197,026 pounds	PSE – 17.6
Mean Weight of Harvest:	15.76 pounds	

Past MRFSS recreational catch and harvest estimates are included in Table 4a and MRIP estimates in Table 4b. All harvest estimates include sub-legal harvest (estimated under poaching in section IB3), illegal harvest outside state waters (federal waters) and harvest that should be credited as New Jersey's commercial harvest (SBBP). At this time, it is unknown as to the extent of this miscalculation, but the final estimate may need adjusting in the future.

Age-7 to 9 and age-13+ striped bass were the most harvested age classes, comprising 77% of the harvest in terms of numbers of fish and 75% of the harvest by weight.

Additional recreational catch statistics were calculated utilizing voluntary logbooks of recreational anglers who participated in the SBBP. Requested data include date, area and number hours fished, lengths from all striped bass kept or released and the type of fishery utilized.



The catch size composition is provided on 3,115 striped bass for 2011 with 18-27 inch fish dominating the catch (Figure 3). Catch and harvest, by region, can be found in Figures 4 and 5, respectively. Recreational anglers in the Mid-Ocean region accounted for the highest percentage of catch and harvest in 2011. Ocean catch (68%) and harvest (56%) was the majority of both catch and harvest while catch and harvest in the Delaware Estuary was lower than previous years.

Catch per effort data, including standard error, from New Jersey's recreational fishery from 1991-2011 was also compiled from voluntary logbooks (Table 5). The 2011 CPUE of 2.00 ranked highest in the time series which averaged 1.46.

### **3. Characterization of Other Losses**

Recreational poaching losses are estimated as 1.3% of the total sub-legal catch. Using the voluntary logbooks, fish less than 28 inches accounted for 50.6% of the total catch in 2011. The MRIP estimate for New Jersey total catch (A1+B1+B2) in 2011 was 1,277,206 striped bass, of which 646,266 are estimated as sublegal. The poaching estimate is therefore 1.3% or 8,401 striped bass.

The hook and release mortality estimate is derived from Bonus Program voluntary logbooks, Party and Charter Boat logbooks and MRIP catch statistics. The length frequency data of released fish from logbooks are used and then scaled to the B2 component of the MRFSS estimates to develop the total released bass-at-length by season (spring and fall) and by mode (shore/private and party/charter). A 2011 New Jersey age-length key is developed by season, using age data from a number of different fishery dependent and independent programs within NJ, to develop the total striped bass release-at-age.

An 8% hook and release mortality is then applied to the total release-at-age data to determine the estimated number of striped bass killed through hook and release. A conservative estimate of 8% hook and release mortality is justified since the majority of the yearly catch in New Jersey comes in Waves 5 (Sept-Oct) and 6 (Nov-Dec) of the MRFSS. The high salinity, low water temperature conditions during these waves support the conservative estimate. The total number of striped bass killed by hook and release mortality in the recreational fishery for 2011 was estimated to be 66,292 fish, with a total weight of 498,011 pounds. Age-6 striped bass were the most discarded, in total number and in total weight (Figure 6a and 6b, respectively).

Table 6 summarizes all striped bass fisheries dependent and independent losses in number and weight for New Jersey in 2011. Total losses of striped bass are estimated as 469,377 fish and 6,769,033 pounds.

## **II. FISHERY INDEPENDENT MONITORING**

In accordance with the Plan, New Jersey is required to:

- A) Conduct a juvenile abundance survey for striped bass in the Delaware River in order to provide a juvenile abundance index, and
- B) Tag the coastal mixed migratory population of striped bass in the Delaware Bay during the late winter/early spring as part of the USFWS Coastal Cooperative Tagging Program.

## **A. Delaware River Young-of-Year Recruitment Survey**

### **1. Methods and Materials**

Since 1980, the Division has conducted a striped bass survey in the Delaware River to provide an annual index of striped bass juvenile abundance. Field sampling utilized a bagged, 100-foot long by 6-foot deep by ¼-inch mesh beach seine. All striped bass caught were quantified and measured. Basic water quality parameters that included water temperature, salinity and dissolved oxygen were also recorded.

By 1987, the survey evolved into a sampling scheme that consisted of sixteen fixed stations twice a month from mid-July through mid-November, with two seine hauls at each station during each event. This format was followed consistently from 1987–1990. After a thorough statistical analysis of the first ten years of data, the consulting firm, Versar Inc, provided a number of recommendations for the survey design. They included: a) sampling season from August through October; b) utilizing both fixed and random stations; c) concentrating fifty percent of the sampling effort to Region II; and d) eliminating replicate samples. These recommendations were incorporated into the sampling protocol from 1991–1997. A fixed station format was followed during the 1998-2011 seasons, where 32 stations (Table 7) were sampled twice a month from August through October. Occasionally due to tidal extremes, sediment, or construction, alternate sites are sampled. Alternate stations used in 2011 are also included in Table 7 for reference.

The Delaware River recruitment survey area (Figure 7) is divided into three distinct habitats:

- 1) Region I -- brackish, tidal water extending from the springtime saltwater/freshwater interface to the Delaware Memorial Bridges
- 2) Region II -- brackish to fresh tidal water extending from the Delaware Memorial Bridges to the Schuylkill River at the Philadelphia Naval Yard, and
- 3) Region III -- tidal freshwater from Philadelphia to the fall line at Trenton

Regions I and II represent the historical striped bass spawning grounds. Saltmarsh vegetation predominates along the Region I shoreline while Region II is primarily urban with a shoreline heavily developed for commerce and industry. Region III is sporadically developed by industry with considerable freshwater marsh.

Current juvenile abundance is reported as the number of striped bass per seine haul from August through October. Estimates for each region and all yearly data were pooled for a whole river index (calculated as a geometric mean index).

### **2. Results**

During the 2011 sampling season, 707 age-zero striped bass were caught in 173 seine hauls, producing a whole river geometric mean CPUE index of 1.41. This ranks as the ninth highest index in the time-series and is above the time-series average of 1.02, as well as the average of the last ten years of 1.33 (Table 8 and Figure 8). Striped bass occurred in 90 out of the 173 samples taken (52%) with individual yoy catches ranging from 0 to 96 bass.

Production was extremely high (2nd in the time-series) in Region I for 2011 (Table 9). The index for Region III was above average, ranking 8<sup>th</sup> in the time series. Region II's index ranked 23<sup>rd</sup> in the time series and was below average. As in most years, the greatest catches of striped bass young-of-year (yoy) occurred during August (Table 10). Figure 9 demonstrates how the August yoy index influences the overall index, especially during years with high recruitment. One

exception to this was in 1995, when the September index was greater than August, although catches were strong during the entire sampling period.

There were 35 yearling striped bass caught for a geometric mean CPUE of 0.13 (Table 11). The number of yearlings ranked 16<sup>th</sup> in the time-series.

The Delaware River Recruitment Survey continues to reflect the overall population of striped bass along the East Coast. The annual recruitment index has been utilized to validate the annual CPUE estimates from the Delaware Division of Fish and Wildlife's Delaware River striped bass spawning stock survey and New Jersey's Ocean Trawl Survey (OTS).

Despite a decent index in 2011, it is likely that production would have been higher. The index and overall catch dropped considerably after Hurricane Irene made landfall in NJ on August 28 causing major flooding of streams and rivers. The high water levels and debris led to a period of three weeks where sampling was not possible. As a result, sampling was not completed in Region 2 for August when striped bass catches are typically high.

## **B. Striped Bass Tagging in Delaware Bay**

### **1. Methods and Materials**

New Jersey joined the efforts of other agencies by entering the U.S. Fish and Wildlife Service's (USFWS) Cooperative Coastal Striped Bass Tagging Program in 1989. Sampling was initiated in areas of Delaware Bay where striped bass had been reported as bycatch in the shad gill net fishery. Gill nets (5 to 6 inch stretch mesh), 600 foot long by 8 to 12 feet deep, were utilized in Delaware Bay during March through April of 2011. Gill nets were allowed to set no longer than fifty-five minutes with an average soak time of forty-five minutes. Striped bass in good condition were processed as follows: fork and total lengths (millimeters) recorded, scale samples taken, tagged using internal anchor/external streamer tags provided by the USFWS and then released. A subsample of tagged fish was weighed. In addition, a subsample of fish caught was retained for biological characterization including otolith removal. Basic water quality parameters, net specifications, duration of the sets and other data as outlined by the USFWS were also recorded.

### **2. Results**

During late winter and early spring of 2011, New Jersey tagged 756 striped bass in the Delaware Bay (Table 12). An additional 83 samples were collected for biological characterization. All fish ranged in total length from 19 to 42 inches, with a mean size of 29.0 inches (Figure 10). A subsample of fish (605) was weighed ranging from 3 to 29 pounds with a mean weight of 8.9 pounds. Striped bass sampled for biological characterization resulted in 58 females and 25 males. An age/length key (Table 13) was developed from aged scale samples (n = 804). Table 14 represents the age frequency composition for striped bass collected in Delaware Bay, utilizing the age key from Table 13. The majority of the fish collected (85%) were ages 6 through 8 years old, with the 2003 year class (age 8) accounting for 33% of the fish sampled.

During 2011, 279 recaptures were reported from the 33,629 striped bass that were tagged and released in the Delaware Bay from 1989–2011 (Table 15 and previous reports). Late spring and early summer were the prime seasons for recaptures, reflecting fishing effort (Table 16). Recapture locations ranged from the coast off Nags Head, North Carolina to the Casco Bay, Maine. Recaptures of tagged fish were recorded from as little as 3 days to 15 years at large. Sport fishing accounted for 71% of the returns, commercial fishing 28% and research 1%. Thirty-one percent of the recaptures were released alive. There have been 8,149 tag returns reported during the twenty-three years of tagging in Delaware Bay, of which 71% have come

from Massachusetts, New York and New Jersey waters, while only 9% occurred south of the Delaware Bay (Figure 11).

### **C. New Jersey Ocean Trawl Survey**

#### **1. Methods and Materials**

The New Jersey Ocean Trawl Survey (OTS) is a multispecies survey that started in August 1988 and samples the near shore waters from the entrance of New York Harbor south, to the entrance of the Delaware Bay five times a year (January, April, June, August and October). There are 15 strata with 5 strata assigned to 3 different depth regimes; inshore (3 to 5 fathoms), mid-shore (5 to 10 fathoms), and off-shore (10 to 15 fathoms). Station allocation and location is random and stratified by strata size (Figure 12).

The survey net is a two-seam trawl with forward netting of 4.7 inch stretch mesh and rear netting of 3.1 inches stretch mesh. The codend is 3.0 inches stretch mesh and is lined with a 0.25 inch bar mesh liner. Each trawl is 20 minutes long and at the end of each tow, the total weight of each species is measured in kilograms and the length of all individuals, or a representative sample by weight for large catches, is measured to the nearest centimeter. A series of water quality parameters, such as surface and bottom salinity, temperature and dissolved oxygen, are also recorded at the start of each tow. Scale samples are taken from a subsample of fish caught from all five cruises and then processed at the lab.

In 2005, New Jersey conducted a thorough evaluation of the striped bass data collected in the OTS, as required by the ASMFC Striped Bass Technical Committee. The analysis determined the survey adequately tracts coastal cohorts and is highly correlated with multiple other coastal and estuarine (recruitment) surveys. A new aggregated index (ages 2:13), as well as an index-at-age (age 2 through 8 and 9:13 aggregate), was developed in 2005 and approved by the Technical Committee. The results were then used for the first time in the 2005 coastwide stock assessment. These indices continue to use only the April cruise information; however, the survey has been re-weighted due to the removal of the offshore strata data and is now calculated as a geometric mean index.

#### **2. Results**

During the 2011 sampling season, there were 147 striped bass caught, with 122 caught during the April cruise (83%), and a majority of those (82%) were caught in the inshore and mid-shore strata (Figure 13). There were 96 age samples collected and processed during the 2011 sampling season. The final April 2011 age-aggregated geometric mean CPUE index was 2.074, which ranks 14<sup>th</sup> in the 23-year time series. The index increased from 2010 but was still below the time series average of 3.27 for the fourth year in a row (Table 17, Figure 14).

Of the 60 age samples collected, age-6 through age-8 striped bass (2005-2003 year class) accounted for 52% of the striped bass caught in April. The strong 2003 year class can be tracked in the 2011 age-specific indices, while the other age classes, younger or older, do not show any real trend when compared to the 2008-2010 April indices (Figure 15). The average (TL) size of striped bass caught in 2011, all cruises included, was 27.0 inches with a range of 5 to 47 inches (Figure 16). A slightly smaller average size (26.2) and range (5 to 40 inches) was caught during the April survey.

### **III. STRIPED BASS MANAGEMENT PROGRAM FOR 2012**

#### **A. Regulations for Striped Bass Management for 2012**

There are no anticipated changes to the recreational striped bass regulations (size, season or bag limit) however the striped bass Bonus Program will be modified for 2012.

#### **B. Striped Bass Monitoring Programs**

##### **1. Fishery Dependent Monitoring**

The SBBP quota, 321,750 pounds, will continue to be monitored weekly to ensure the quota is not exceeded. Bureau personnel will continue to collect biological samples, scales and/or otoliths and weights, from striped bass.

SBBP logbooks, as well as the on-line reporting system, for individuals will continue in 2012. Length frequency of kept and released striped bass, CPUE estimates by area, month and mode, and harvest and catch rates will be determined from the data collected by the reporting forms.

Effective June 8, 2012, the NJDEP Division of Fish and Wildlife is indefinitely suspending the Party/Charter Boat facet of the Striped Bass Bonus Program. This does not impact the individual angler facet of the SBBP nor does it affect the current recreational fisheries regulations for striped bass. Recreational anglers without a SBBP permit, including those fishing on for-hire vessels, can still harvest two striped bass per day at 28 inches or larger. Party/Charter Boat anglers can still harvest a 'bonus' bass if they obtain a SBBP permit from the Division's website prior to their fishing trip and have the permit in possession while fishing on the for-hire vessel.

##### **2. Fishery Independent Monitoring**

New Jersey will continue monitoring juvenile abundance in the Delaware River. All striped bass will be counted and measured after each seine haul. A juvenile abundance index, geometric mean, will be calculated to continue the time series of striped bass recruitment in the Delaware River for use in the coastwide stock assessment.

New Jersey will also continue winter/spring tagging of striped bass in Delaware Bay. All fish caught in good condition will be measured, weighed, scale samples will be taken and tagged with USFWS tags and then released. This information will be provided to the USFWS for use in the coastwide tagging assessment and in evaluating New Jersey's striped bass fishery.

Lastly, Bureau personnel will be continuing the Ocean Trawl Survey. All striped bass, in all 5 survey cruises, will be measured and weighed and a sub-sample will be aged. A weighted age-aggregate and age-specific geometric mean CPUE index will be calculated for the April survey for continued use in the coastwide stock assessment.

##### **3. Additional Information**

In 2010, New Jersey instituted new protocols for biological sampling in order to streamline the collection process and eliminate duplicate data or data not being used for the coastal assessment. A recent decrease in sample sizes necessitated a change in the methods used to collect samples resulting in the development of a new long-term plan.

By targeting fishing tournaments and party/charter boats in the spring and fall of 2011, New Jersey collected 253 scale samples and 39 otolith samples during two party boat trips and ten tournaments. The size range of these fish was 25 to 47 inches with a mean size of 37.8 inches. New Jersey plans to continue this sampling in 2012.

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Table 1. Summary of New Jersey's striped bass bonus harvest information: 1996-2011

Year	# Harvested	Weight Harvested (lbs)	Mean Length (inches)	Mean Weight	Quota	% of Quota
1996	233	4,050	35.7	17.4	225,000	1.8
1997	344	7,678	36.8	22.3	225,000	3.4
1998	473	11,149	37.2	23.6	225,000	5
1999	574	13,174	36.2	23.1	225,000	5.9
2000	2,488	42,794	33.7	17.2	225,000	19
2001	4,583	79,774	33.5	17.4	225,000	35.5
2002	4,855	82,050	33.0	16.9	225,000	36.5
2003	6,101	121,410	35.0	20.0	321,750	37.7
2004	4,602	81,870	32.8	17.8	321,750	25.4
2005	2,047	29,866	31.7	14.6	321,750	9.3
2006	1,127	23,656	34.9	21.0	321,750	7.4
2007	708	13,615	34.0	19.2	321,750	4.2
2008	367	7,345	34.3	20.0	321,750	2.3
2009	526	10,330	34.2	19.3	321,750	3.2
2010	728	12,833	34.5	17.6	321,750	4.0
2011	916	16,332	34.0	17.8	321,750	5.1

Table 2. New Jersey striped bass bonus harvest age/length key: 2011

Total Length (inch)	PERCENT AT AGE															
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
28		50			50											
29	6.3	6.3	6.3	43.8	25	6.3	6.3									
30			4.3	30.4	52.2	13										
31			6.1	21.2	60.6	12.1										
32		2.2	10.9	19.6	50	10.9	6.5									
33			0	10	63.3	20		6.7								
34			3.4	20.7	41.4	17.2	10.3	3.4	3.4							
35			3.1	12.5	40.6	25	9.4	3.1	3.1				3.1			
36				16.7	41.7		25	16.7								
37						50	16.7	16.7		16.7						
38				12.5	12.5	25	12.5	25			12.5					
39							25	50	25							
40								50				50				
41							66.7			33.3						
42										66.7	33.3					
43										25	75					
44											100					
45											100					
46											33.3	33.3			33.3	
47										50	50					
48											50		50			

Table 3. Estimated striped bass bycatch and non-harvest loss from the American shad gill net fishery: 2005-2011\*

	2005	2006	2007	2008	2009	2010	2011
American Shad Commercial Landings NMFS (1996-1999); State (2000-2010)	91,508	68,308	66,418	30,146	13,999	13,360	12,084
# Pounds of Shad Landed per Striped Bass Caught	9.0	3.9	7.1	2.8	1.0	2.5	4.9
# of Striped Bass Caught	10,170	17,570	9,346	10,635	14,021	5,352	2,483
Striped Bass Mortality	2,097	2,791	1,638	1,035	626	1,194	492
Mean Weight of Striped Bass in By-Catch (pounds)	7.7	8.0	9.2	10.4	6.8	7.7	8.9
Striped Bass Non-Harvest Loss (pounds)	16,147	22,328	15,070	10,764	4,257	9,170	4,379

\* Data from 2000 through 2004 can be found in previous reports or by request

Table 4 (a). New Jersey striped bass recreational catch statistics (MRFSS): 2004-2011

Year	Total Catch (Numbers)	Total Harvest (Numbers)	Total Harvest (Pounds)	Mean Weight (Pounds)
2004	1,772,060	448,524 (25.3%)	5,458,535	12.2
2005	1,524,456	327,016 (21.5%)	3,793,470	11.6
2006	2,591,135	489,319 (18.9%)	6,623,537	13.5
2007	1,700,847	206,275 (12.1%)	2,441,469	11.8
2008	1,770,363	318,115 (18.0%)	4,743,038	14.9
2009	988,343	269,166 (27.2%)	3,807,088	14.1
2010	821,443	314,698 (38.3%)	4,693,882	14.9
<b>2011</b>	<b>1,261,031</b>	<b>406,204 (32.2%)</b>	<b>5,861,858</b>	<b>14.4</b>

Table 4 (b). New Jersey striped bass recreational catch statistics (MRIP): 2004-2011

Year	Total Catch (Numbers)	Total Harvest (Numbers)	Total Harvest (Pounds)	Mean Weight (Pounds)
2004	1,926,901	424,208 (22.0%)	5,548,167	13.1
2005	1,630,424	411,531 (25.2%)	5,958,454	14.5
2006	2,399,897	509,602 (21.2%)	7,067,533	13.9
2007	2,078,951	289,657 (13.9%)	3,718,451	12.8
2008	1,618,865	309,412 (19.1%)	4,696,090	15.2
2009	1,083,536	283,026 (26.1%)	4,238,319	15.0
2010	1,010,753	320,413 (31.7%)	5,382,744	16.8
<b>2011</b>	<b>1,277,206</b>	<b>393,193 (30.8%)</b>	<b>6,197,026</b>	<b>15.8</b>



Table 5. New Jersey's striped bass recreational CPUE from bonus logs: 1991-2011

Year	# of Directed Trips	# of Striped Bass Caught	# of Logs Analyzed	CPUE (Catch/Trip)	St. Err.
1991	7,883	8,800	601	1.11	0.020
1992	15,690	14,017	2,053	0.89	0.018
1993	11,374	12,395	1,249	1.09	0.023
1994	6,654	5,778	817	0.87	0.024
1995	5,114	5,628	643	1.10	0.027
1996	5,310	7,234	737	1.36	0.029
1997	5,125	6,385	815	1.25	0.031
1998	7,174	12,914	670	1.80	0.040
1999	7,877	12,708	820	1.61	0.030
2000	12,294	15,959	1,400	1.30	0.018
2001	12,573	19,476	1,500	1.55	0.020
2002	22,196	29,088	2,485	1.31	0.014
2003	21,996	31,595	2,539	1.44	0.015
2004	12,859	19,684	1,493	1.53	0.021
2005	15,306	24,589	2,043	1.61	0.027
2006	27,661	49,856	3,151	1.80	0.021
2007	10,076	17,988	911	1.79	0.033
2008	2,748	4,921	334	1.79	0.057
2009	1,875	3,570	247	1.90	0.058
2010	1,249	1,922	184	1.54	0.068
<b>2011</b>	<b>1,156</b>	<b>3,115</b>	<b>211</b>	<b>2.00</b>	<b>0.047</b>

Table 6. Preliminary striped bass harvest loss estimates for New Jersey: 2011

	Losses in Number	Mean Weight (lbs)	Losses in Pounds
<b>Commercial Harvest</b> (Bonus Program)	916	17.75	16,259
<b>Commercial Discards</b> (Shad bycatch estimate)	492	8.87	4,379
<b>Recreational Harvest</b> (MRIP estimate)	393,193	15.76	6,197,026
<b>Recreational Discards</b> Catch & Release Mortality	66,292	7.51	498,011
<b>Recreational Poaching</b>	8,401	6.26	52,590
<b>Monitoring</b> (NJDEP samples)	83	9.25	768
<b>Total</b>	<b>469,377</b>		<b>6,769,033</b>

Table 7. Delaware River Recruitment Survey sampling station locations: 2011

Region	StationCode	Name	Rivermile	Latitude	Longitude
I	29	Augustine Beach	53.5	3930.435	7534.617
I	1	Clay Beach	55.4	3930.955	7531.622
I	2	Oakwood Beach	58.7	3933.418	7531.079
I	3	Fort Mott	61.4	3936.092	7533.155
I	4	Gambles Gut	63.4	3938.318	7535.886
I	5	New Castle	65.9	3939.422	7533.984
I	6	Penns Beach	66.2	3938.908	7531.956
I	35	Pennsville	66.3	3938.987	7531.907
I	7	Churchtown	67.7	3940.246	7530.790
II	30	Helms Cove	70.9	3942.847	7528.722
II	33	South Penns Grove	71.9	3944.566	7528.172
II	8	Rodneys Hideout	73	3944.425	7528.261
II	9	Oldmans Point	74.8	3945.758	7527.693
II	10	Naaman Creek	77.6	3947.762	7527.136
II	11	Raccoon Creek	80.7	3948.668	7522.871
II	12	Old Canal Corner	82.4	3949.610	7521.241
II	13	Chester Island	83.5	3950.393	7520.542
II	14	Sand Ditch	84.9	3950.531	7518.672
II	36	South Tinicum Island	86.1	3951.222	7518.076
II	15	Tinicum Island	86.9	3951.132	7516.836
II	16	Tinicum Island (NE; Pa SIDE)	87.5	3951.270	7516.360
II	31	Bramell Point	87.6	3950.487	7516.162
II	17	UPS Beach	88	3951.443	7515.407
II	34	Paulsboro	88.9	3951.031	7514.671
II	19	Mantua Creek	89.8	3951.175	7513.500
II	20	Pebble Beach	92.6	3952.498	7511.577
II	21	Eagle Point	94.4	3952.685	7510.647
III	22	Pennsauken Creek	105.8	3959.890	7503.186
III	23	Pompestron Creek	108.8	4001.237	7500.397
III	24	Hawk Island	111.8	4002.720	7458.514
III	25	Cornwells Heights	114.8	4004.415	7455.069
III	26	Edgewater Park	116.5	4004.365	7453.400
III	27	Burlington Island	118.5	4005.222	7451.395
III	28	Landreth Channel	120.4	4006.276	7449.950
III	32	Newbold Island	125.7	4007.671	7446.070

Table 8. Delaware River striped bass indices of relative abundance: 1980–2011

Year	# of Hauls	YOY (n)	Arithmetic Mean	Standard Error	Proportion of Positive Hauls	Geometric Mean	95% Confidence Interval Lower Limit	95% Confidence Interval Upper Limit	Range
1980	20	2	0.10	0.05	0.100	0.07	-0.03	0.18	0 - 1
1981	13	0	0.00	0.00	0.000	0.00	0.00	0.00	0 - 0
1982	26	4	0.15	0.05	0.115	0.10	-0.01	0.23	0 - 2
1983	22	2	0.09	0.04	0.091	0.07	-0.02	0.16	0 - 1
1984	29	18	0.62	0.10	0.345	0.37	0.14	0.65	0 - 5
1985	56	5	0.09	0.03	0.018	0.03	-0.03	0.10	0 - 5
1986	46	23	0.50	0.07	0.304	0.32	0.16	0.51	0 - 4
1987	96	150	1.56	0.08	0.281	0.53	0.30	0.78	0 - 32
1988	96	60	0.63	0.05	0.292	0.35	0.21	0.49	0 - 11
1989	96	321	3.34	0.09	0.531	1.07	0.73	1.48	0 - 125
1990	96	218	2.27	0.08	0.552	1.05	0.74	1.41	0 - 43
1991	256	270	1.05	0.04	0.301	0.47	0.35	0.59	0 - 22
1992	258	985	3.82	0.06	0.500	1.18	0.93	1.46	0 - 94
1993	204	1,183	5.80	0.08	0.603	1.78	1.39	2.23	0 - 185
1994	204	473	2.32	0.06	0.520	0.96	0.74	1.19	0 - 35
1995	204	1,552	7.61	0.08	0.613	1.98	1.54	2.50	0 - 211
1996	204	892	4.37	0.08	0.583	1.70	1.34	2.12	0 - 67
1997	205	461	2.25	0.06	0.512	1.01	0.79	1.25	0 - 34
1998	166	582	3.51	0.08	0.536	1.31	1.00	1.67	0 - 108
1999	192	932	4.85	0.08	0.630	1.90	1.51	2.36	0 - 130
2000	192	1,164	6.06	0.08	0.573	1.78	1.36	2.26	0 - 113
2001	192	511	2.66	0.06	0.557	1.20	0.95	1.49	0 - 55
2002	192	249	1.30	0.05	0.354	0.53	0.39	0.69	0 - 27
2003	192	1,670	8.70	0.09	0.656	2.47	1.93	3.11	0 - 277
2004	192	573	2.98	0.07	0.443	1.13	0.86	1.45	0 - 32
2005	190	474	2.49	0.06	0.584	1.22	0.97	1.51	0 - 26
2006	192	246	1.28	0.05	0.427	0.67	0.52	0.84	0 - 16
2007	192	520	2.71	0.06	0.630	1.41	1.14	1.72	0 - 36
2008	160	395	2.47	0.07	0.563	1.26	0.98	1.58	0 - 31
2009	192	1,101	5.73	0.08	0.615	1.92	1.50	2.42	0 - 146
2010	192	487	2.54	0.06	0.604	1.30	1.04	1.59	0 - 28
<b>2011</b>	<b>173</b>	<b>707</b>	<b>4.09</b>	<b>0.08</b>	<b>0.520</b>	<b>1.41</b>	<b>1.08</b>	<b>1.79</b>	<b>0 - 96</b>
<b>AVG</b>		<b>507</b>	<b>2.75</b>	<b>0.07</b>	<b>0.436</b>	<b>1.02</b>	<b>0.77</b>	<b>1.31</b>	

1980 – 1990: fixed station design with replicate sets; second half of July through first half of November

1991 – 1997: fixed and random station design with no replicate sets; August through October

1998 – 2010: fixed station design with no replicates; August through October

Table 9. Delaware River recruitment index, geometric mean, by region: 1980–2011

<b>YEAR</b>	<b>Region I</b>	<b>Region II</b>	<b>Region III</b>	<b>Whole River</b>	<b>HAULS</b>
1980	0.08	0.00	0.00	0.07	20
1981	0.00	0.00	0.00	0.00	13
1982	0.10	0.41	0.00	0.10	26
1983	0.00	0.59	0.00	0.07	22
1984	0.08	1.57	0.52	0.37	29
1985	0.00	0.16	0.00	0.03	56
1986	0.04	1.20	0.17	0.32	46
1987	0.82	1.02	0.06	0.53	96
1988	0.38	0.60	0.17	0.35	96
1989	1.58	2.42	0.19	1.07	96
1990	1.13	2.73	0.32	1.05	96
1991	0.28	0.83	0.06	0.47	256
1992	0.85	1.36	1.20	1.18	258
1993	2.39	2.65	0.32	1.78	204
1994	0.98	1.33	0.36	0.96	204
1995	1.60	3.81	0.31	1.98	204
1996	2.80	2.18	0.39	1.70	204
1997	1.43	1.21	0.36	1.01	205
1998	0.75	2.01	0.78	1.31	166
1999	1.44	3.27	0.60	1.90	192
2000	2.71	2.64	0.20	1.78	192
2001	0.95	1.79	0.55	1.20	192
2002	0.21	0.83	0.37	0.53	192
2003	8.30	1.98	0.76	2.47	192
2004	4.57	0.78	0.17	1.13	192
2005	3.84	0.68	0.77	1.22	190
2006	1.25	0.67	0.26	0.67	192
2007	2.47	1.68	0.36	1.41	192
2008	0.87	1.61	1.06	1.26	192
2009	4.27	2.10	0.45	1.92	192
2010	3.91	1.17	0.21	1.30	192
<b>2011</b>	<b>5.00</b>	<b>0.80</b>	<b>0.54</b>	<b>1.41</b>	<b>173</b>
<b>1980-2011</b>	1.72	1.44	0.36	1.02	

Table 10. Delaware River recruitment index, geometric mean, by month: 2011

Month	Region I	Region II	Region III	Whole River
<b>August</b>	4.53	2.00	2.36	<b>2.82</b>
<b>September</b>	5.60	0.71	0.09	<b>1.14</b>
<b>October</b>	4.92	0.44	0.00	<b>0.89</b>
<b>Year</b>	5.00	0.80	0.54	<b>1.41</b>

Table 11. Delaware River striped bass age-1 relative abundance: 1980–2011

Year	Geometric Mean	95% Confidence Interval Lower Limit	95% Confidence Interval Upper Limit	Year	Geometric Mean	95% Confidence Interval Lower Limit	95% Confidence Interval Upper Limit
1980	0.035	-0.037	0.112	1996	0.077	0.042	0.113
1981	0.000	0.000	0.000	1997	0.327	0.224	0.439
1982	0.000	0.000	0.000	1998	0.152	0.078	0.231
1983	0.032	-0.033	0.102	1999	0.284	0.197	0.377
1984	0.116	0.004	0.240	2000	0.112	0.063	0.163
1985	0.079	0.009	0.154	2001	0.064	0.025	0.104
1986	0.056	-0.007	0.123	2002	0.181	0.116	0.250
1987	0.112	0.045	0.184	2003	0.077	0.042	0.113
1988	0.124	0.060	0.192	2004	0.110	0.065	0.156
1989	0.143	0.084	0.205	2005	0.079	0.040	0.120
1990	0.265	0.177	0.360	2006	0.154	0.101	0.209
1991	0.154	0.085	0.228	2007	0.051	0.019	0.084
1992	0.238	0.172	0.307	2008	0.310	0.224	0.402
1993	0.130	0.076	0.186	2009	0.076	0.039	0.115
1994	0.315	0.215	0.423	2010	0.160	0.098	0.225
1995	0.081	0.040	0.124	<b>2011</b>	<b>0.126</b>	<b>0.079</b>	<b>0.175</b>

Table 12. Striped bass tagging effort in Delaware Bay: 2011

<b>Date</b>	<b>Number of Sets</b>	<b>Number of Hours Fished</b>	<b>Number of Bass Caught</b>	<b>Number of Bass Tagged</b>
03/08/2011	6	3.0	23	23
03/09/2011	1	0.6	2	0
03/15/2011	7	3.5	10	10
03/30/2011	9	4.0	79	69
04/13/2011	6	2.6	104	97
04/14/2011	2	1.3	90	77
04/18/2011	8	3.7	91	87
04/19/2011	6	2.3	146	140
04/20/2011	6	2.5	145	129
04/25/2011	5	1.4	100	74
04/27/2011	5	2.3	78	50
05/03/2011	3	1.3	1	0
05/11/2011	5	2.7	4	0
05/19/2011	3	1.3	0	0
<b>Total</b>	<b>72</b>	<b>32.5</b>	<b>873</b>	<b>756</b>

Table 13. Spring age-length key of striped bass collected in Delaware Bay: 2011

Total Length (inch)	PERCENT AT AGE										
	4	5	6	7	8	9	10	11	12	13	14
19	100										
20	66.7	33.3									
21	55.6	11.1	33.3								
22	30	30	30			10					
23	26.7	13.3	20	40							
24	6.1	27.3	27.3	24.2	12.1	3					
25	6.1	15.2	54.5	18.2	6.1						
26		11.6	55.1	26.1	7.2						
27		6.2	43.2	33.3	13.6	1.2	2.5				
28		0.8	22	43.2	31.1	2.3	0.8				
29			10.5	46	39.5	4					
30			6.5	31.5	54	6.5	1.6				
31			3.8	23.8	56.3	11.3	3.8	1.3			
32				17	48.9	31.9	2.1				
33			5.9	11.8	70.6		11.8				
34				6.3	43.8	37.5	12.5				
35					40		40		20		
36							100				
37							50				50
38							50				50
39											100
40								100			
41								100			
42								100			

Table 14. Age frequency of striped bass collected in Delaware Bay: 2011

<b>AGE</b>	<b>MEAN LENGTH (TL/inches)</b>	<b>YEAR CLASS</b>	<b>FREQUENCY</b>	<b>PERCENT FREQUENCY</b>
4	22.4	2007	20	2.5
5	25.3	2006	35	4.4
6	27.2	2005	163	20.3
7	28.9	2004	248	30.8
8	30.3	2003	268	33.3
9	31.2	2002	49	6.1
10	32.1	2001	16	2.0
11	38.1	2000	3	0.4
12	35.4	1999	1	0.1
13		1998		0.0
14	39.8	1997	1	0.1
<b>TOTAL</b>			804	100.0



Table 15. Delaware Bay striped bass tag release/recapture matrix: 1996-2011\*

Release Year	Number Released	Number Recaptured By Year															Total Recaptured	
		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010		2011
1996	2,009	219	136	119	46	34	27	13	12	9	6	1	1	1		2	2	628
1997	508		58	22	20	5	9	7	4	2		5						132
1998	853			97	48	45	29	19	12	4	6	2	2					264
1999	1,865				146	115	76	51	29	24	25	16	4	3	1	1		491
2000	2,399					202	159	85	72	44	16	17	9	5	2	7	3	621
2001	2,386						224	124	91	54	35	19	9	7	4	1	1	569
2002	1,832							104	96	61	27	27	8	11	6	2	4	346
2003	2,395								200	131	88	41	29	23	14	5	4	535
2004	1,885									198	109	64	33	29	26	8	3	470
2005	1,329										120	64	39	28	16	15	5	287
2006	1,470											114	79	45	35	23	15	311
2007	1,152												102	54	42	32	29	259
2008	1,478													113	91	57	45	306
2009	2,239														181	133	70	384
2010	1,195															84	49	133
2011	756																49	49
<b>Total**</b>	<b>33,629</b>	<b>637</b>	<b>438</b>	<b>420</b>	<b>366</b>	<b>452</b>	<b>561</b>	<b>424</b>	<b>539</b>	<b>538</b>	<b>439</b>	<b>379</b>	<b>320</b>	<b>323</b>	<b>419</b>	<b>372</b>	<b>279</b>	<b>8,149</b>

\* Data from 1989 through 1995 can be found in previous reports or by request

\*\* Total is for the entire time series

Table 16. Number of striped bass tagged in Delaware Bay and recaptured during 2011, by state and month

State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Maine						2	3	1	1				7
Massachusetts					11	18	26	13	3	4	1		76
New Hampshire						3	1						4
Rhode Island					1	8	4	2	5	1			21
Connecticut					1	4	2		1				8
New York		1			10	14	4	3	5	7	3		47
Pennsylvania				1									1
New Jersey			1	4	18	4	2		1	3	22	10	65
Delaware			1	1	3		1				1		7
Maryland	1		1	12	7	1				1		1	24
Virginia	1	2	1		1	1				1		2	9
North Carolina	5												5
Total	7	3	4	18	52	55	43	19	16	17	27	13	274

Table 17. April Ocean Trawl Survey striped bass geometric mean per tow: 1989–2011

Year	GM CPUE (unweighted)	95% Confidence Intervals		GM CPUE (weighted)
		Lower Limit	Upper Limit	
1989	0.470	0.077	1.006	0.234
1990	0.659	0.148	1.399	1.130
1991	0.872	0.318	1.660	1.414
1992	0.655	0.269	1.158	0.648
1993	0.586	0.213	1.074	0.670
1994	1.145	0.605	1.867	1.470
1995	6.814	3.555	12.405	5.239
1996	5.442	2.706	10.199	5.880
1997	5.670	2.691	11.053	6.541
1998	7.798	4.480	13.125	5.974
1999	3.385	1.705	6.108	3.675
2000	6.527	4.166	9.968	5.730
2001	2.049	1.160	3.303	1.677
2002	1.403	0.556	2.713	2.148
2003	6.373	3.563	10.913	7.783
2004	6.073	3.657	9.742	6.050
2005	7.016	3.459	13.411	6.412
2006	2.127	0.845	4.300	2.605
2007	3.572	1.870	6.284	3.503
2008	1.401	0.665	2.463	1.381
2009	1.576	0.731	2.833	2.236
2010	0.778	0.146	1.756	0.731
<b>2011</b>	<b>1.788</b>	<b>0.880</b>	<b>3.135</b>	<b>2.074</b>
Time series Avg.	3.225	1.672	5.734	3.270

\* Table does not include offshore station data

Figure 1. Percent length frequency (tl, in) of Striped Bass Bonus Program harvest: 2011

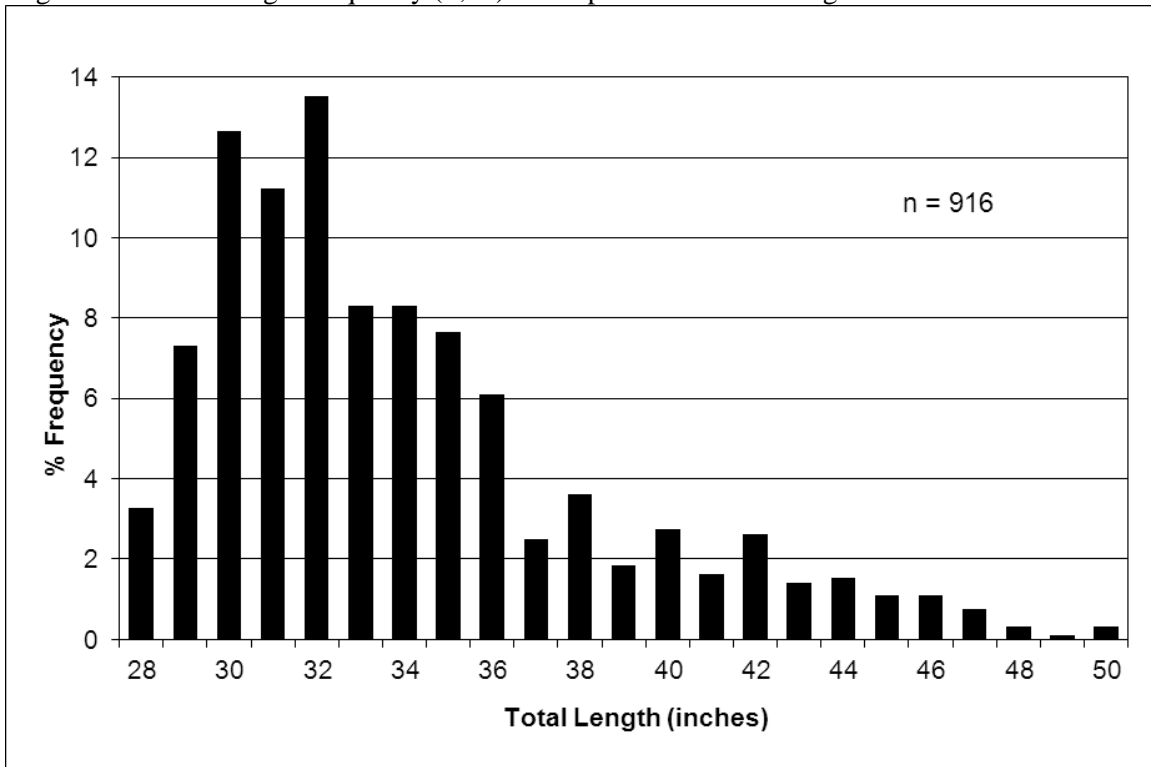


Figure 2. Percent weight frequency (lbs) of Striped Bass Bonus Program harvest: 2011

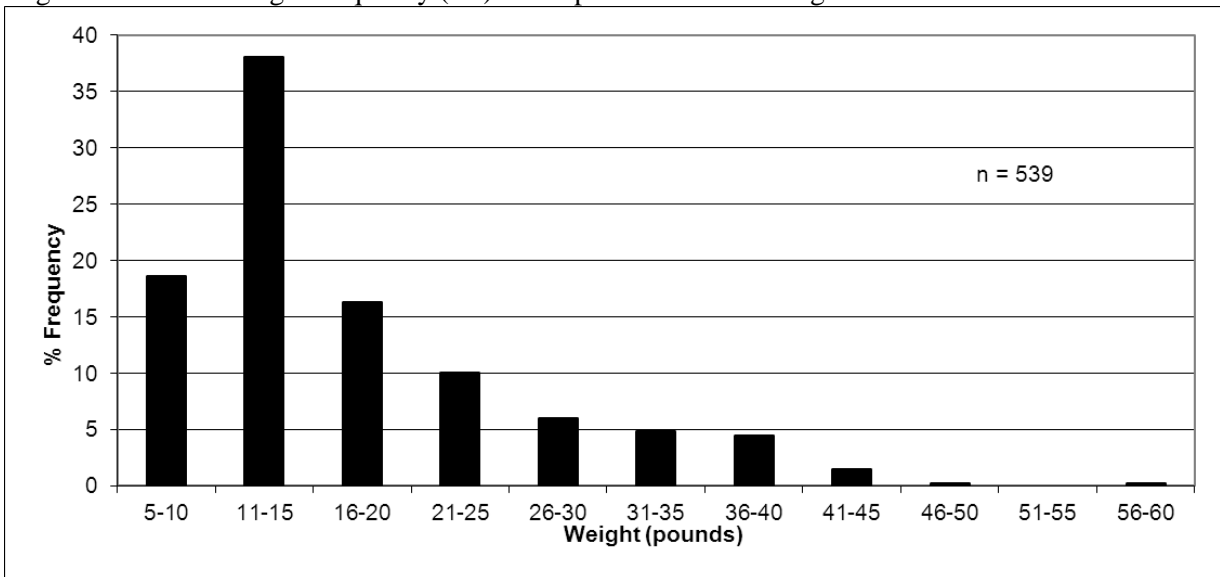


Figure 3. Percent length frequency (tl, in) of Striped Bass Bonus Program catch: 2007–2011

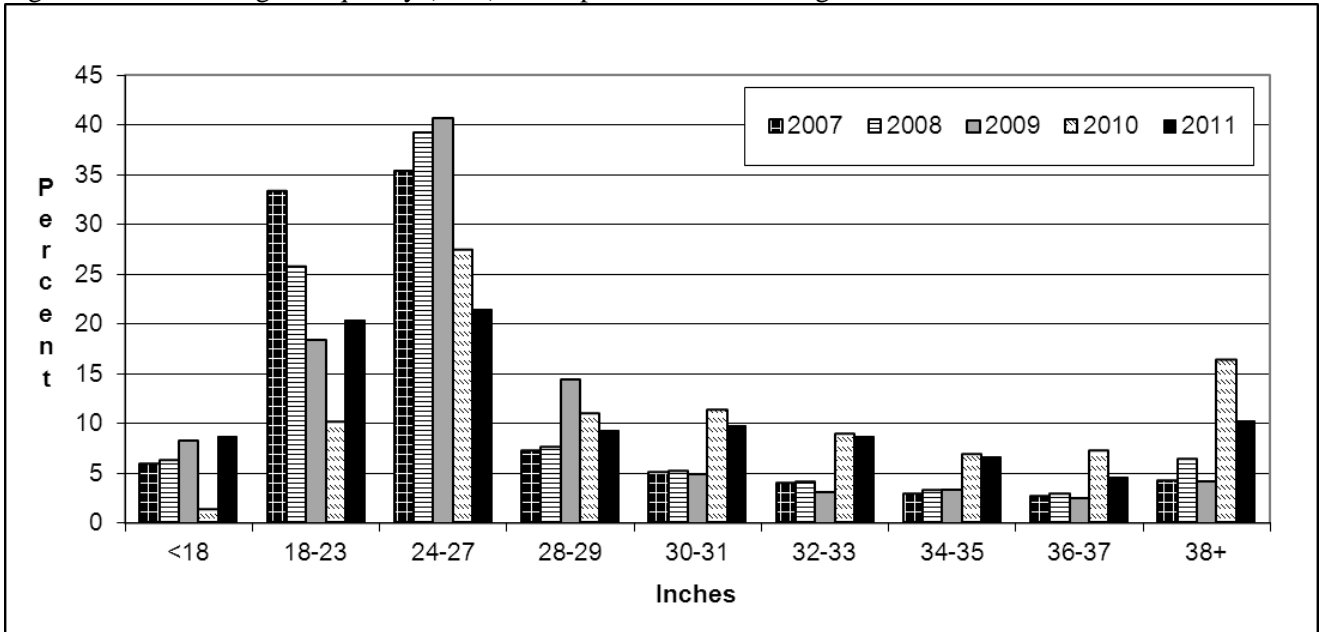


Figure 4. New Jersey Striped Bass Bonus Program regional catch: 2011

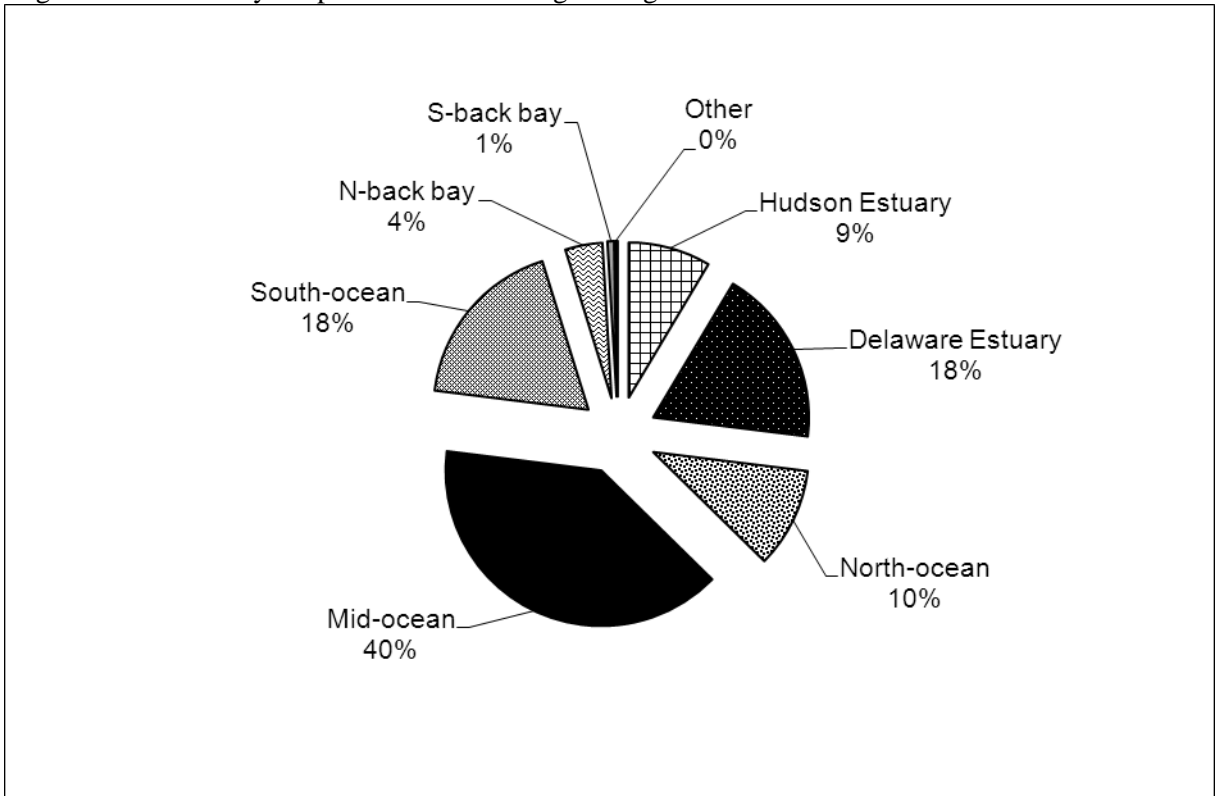


Figure 5. New Jersey Striped Bass Bonus Program regional harvest: 2011

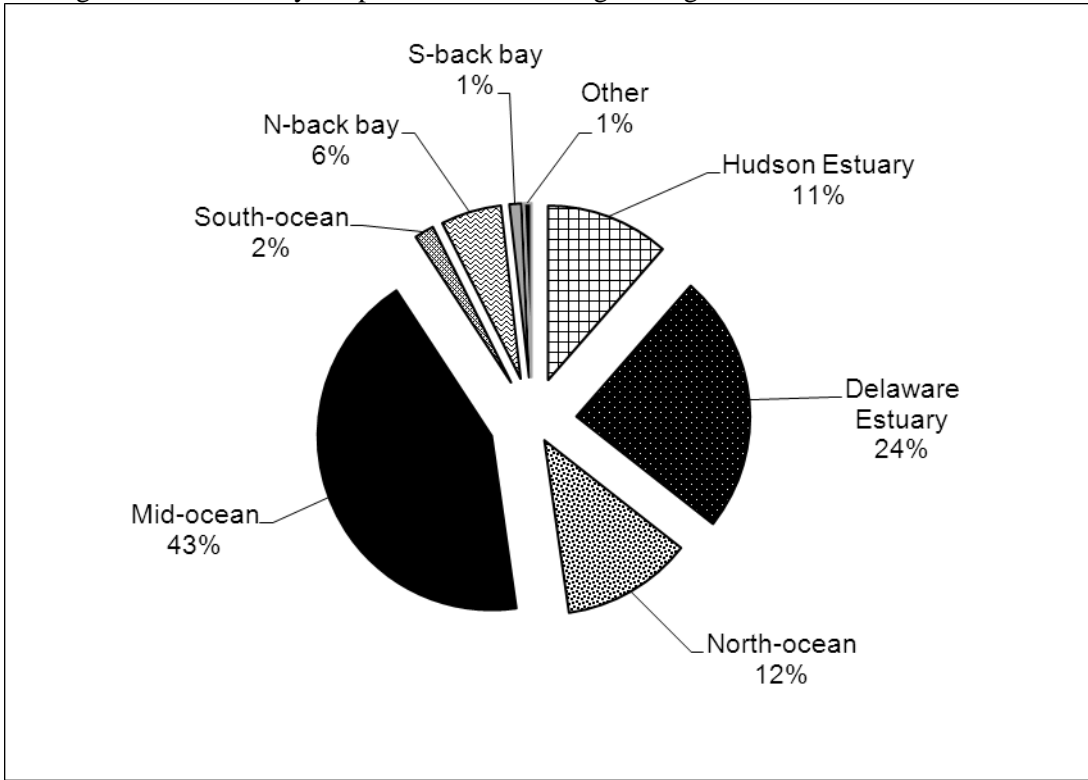


Figure 6. New Jersey recreational striped bass discards at age, by number (a) and weight (b): 2011

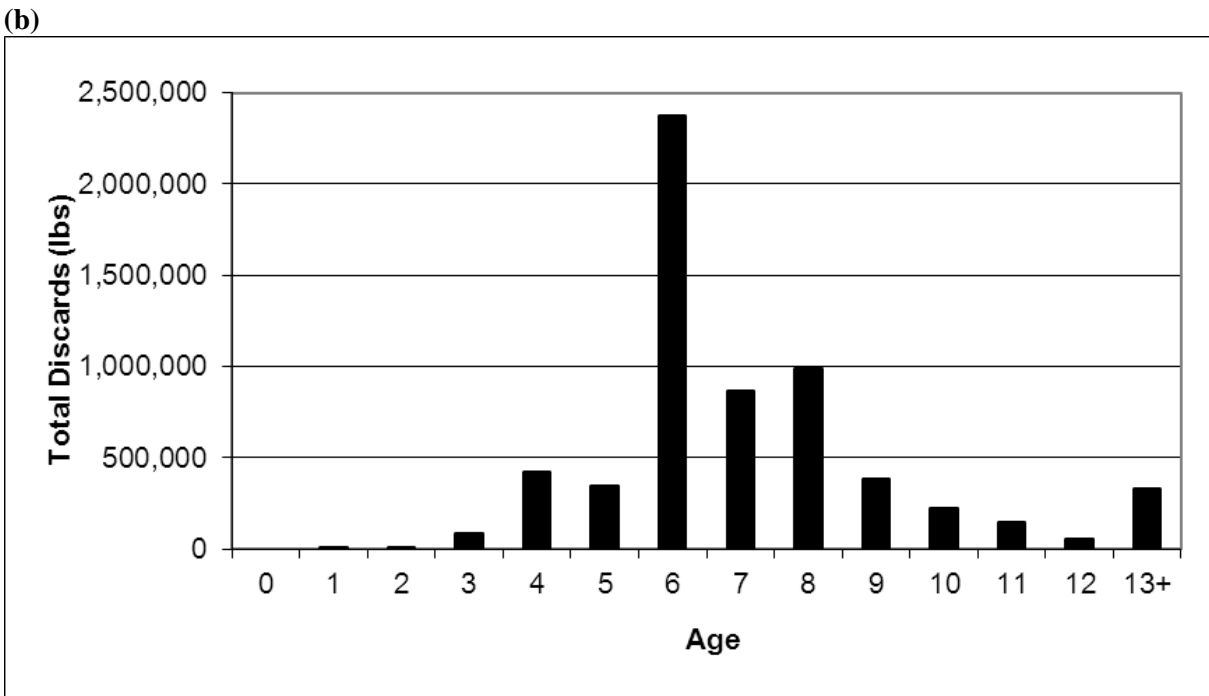
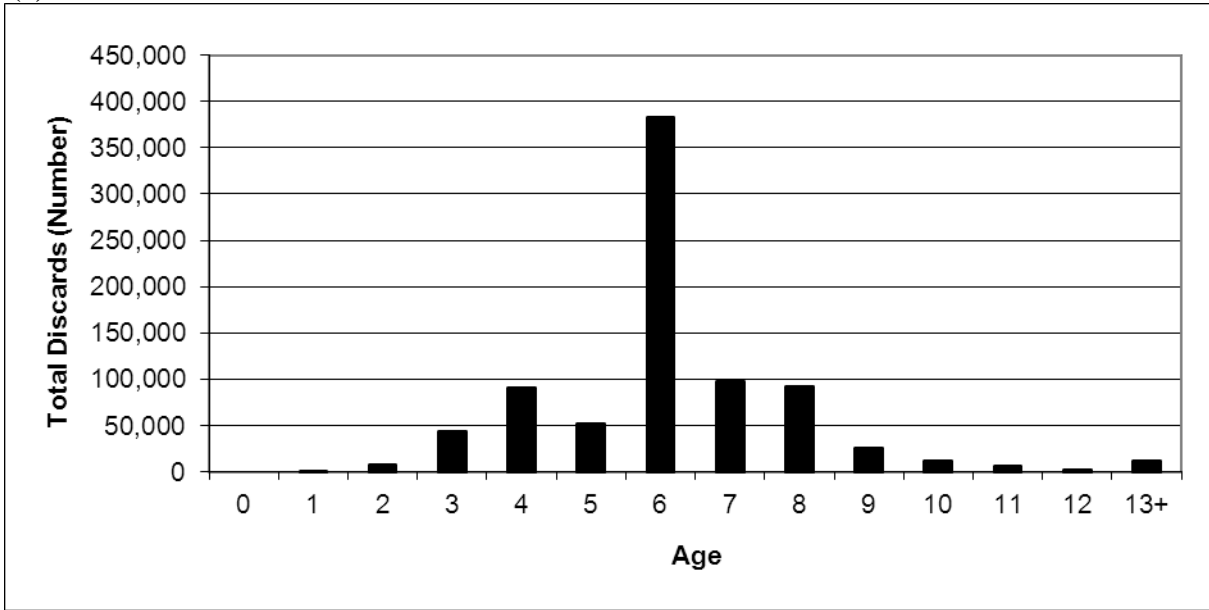


Figure 7. Delaware River Recruitment Survey sampling stations: 2011

### DELAWARE RIVER RECRUITMENT SURVEY SAMPLING AREA

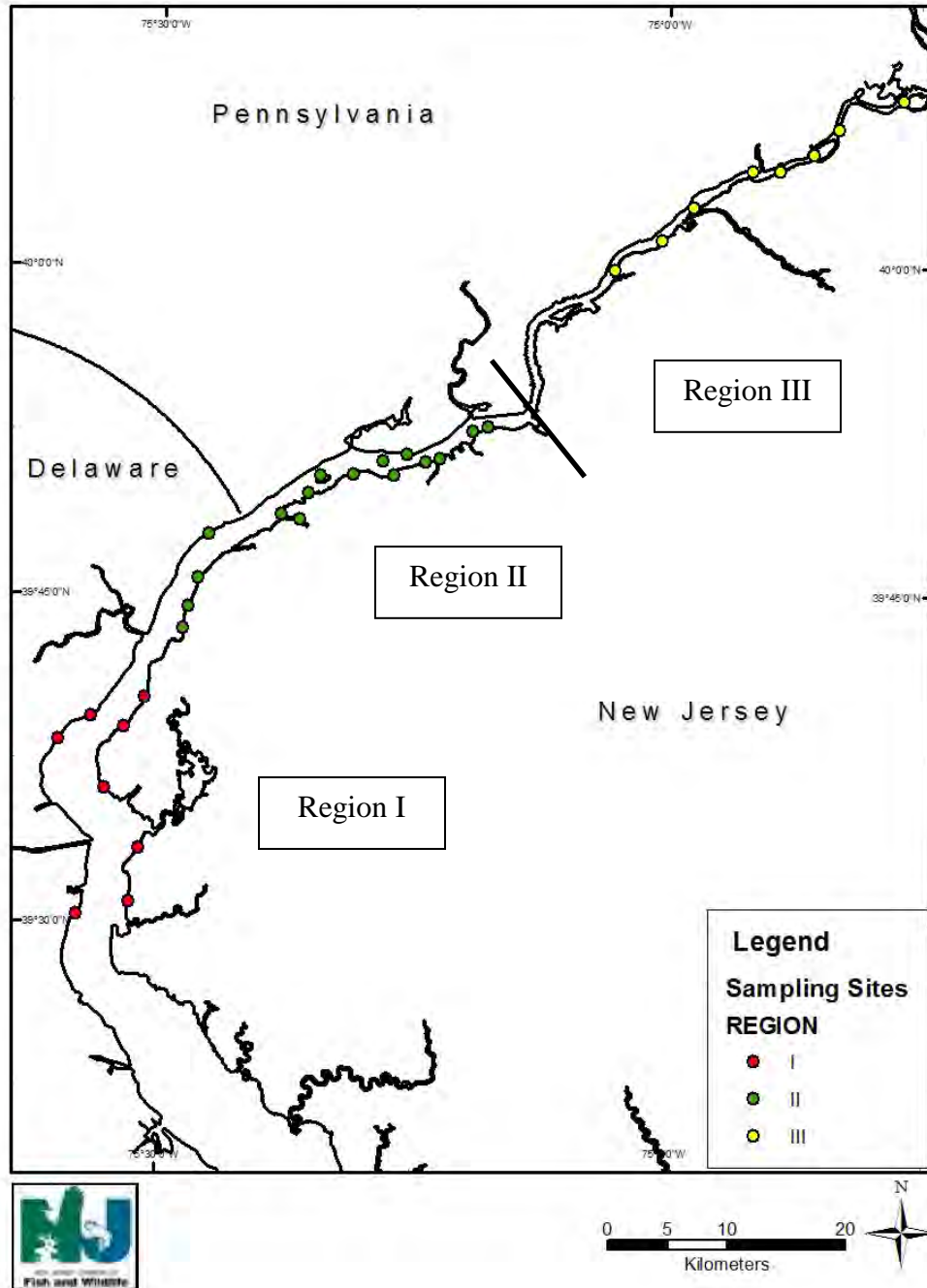
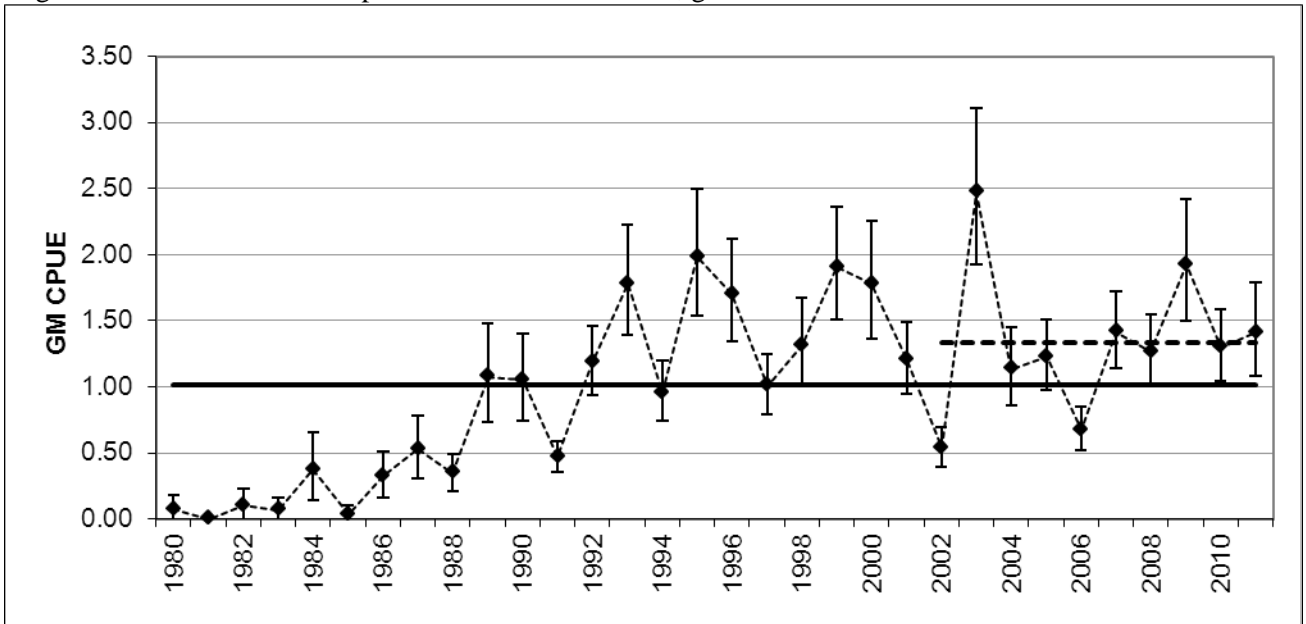


Figure 8. Delaware River striped bass recruitment index, geometric mean: 1980-2011



- \*Bars represent 95% confidence intervals
- \*Solid line represents time series (1980–2011) average
- \*Dashed line represents the last ten years (2002–2011) average

Figure 9. Delaware River striped bass recruitment, geometric mean, by month: 1980-2011

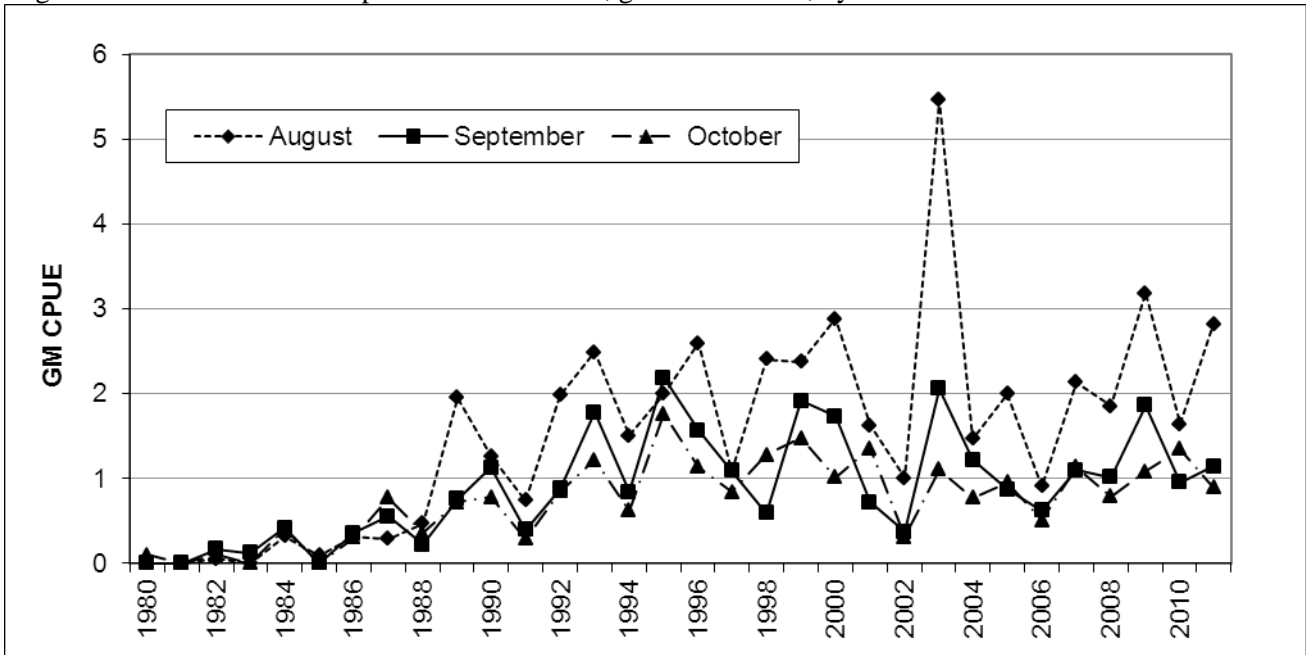




Figure 10. Percent length frequency of striped bass from Delaware Bay: spring 2011

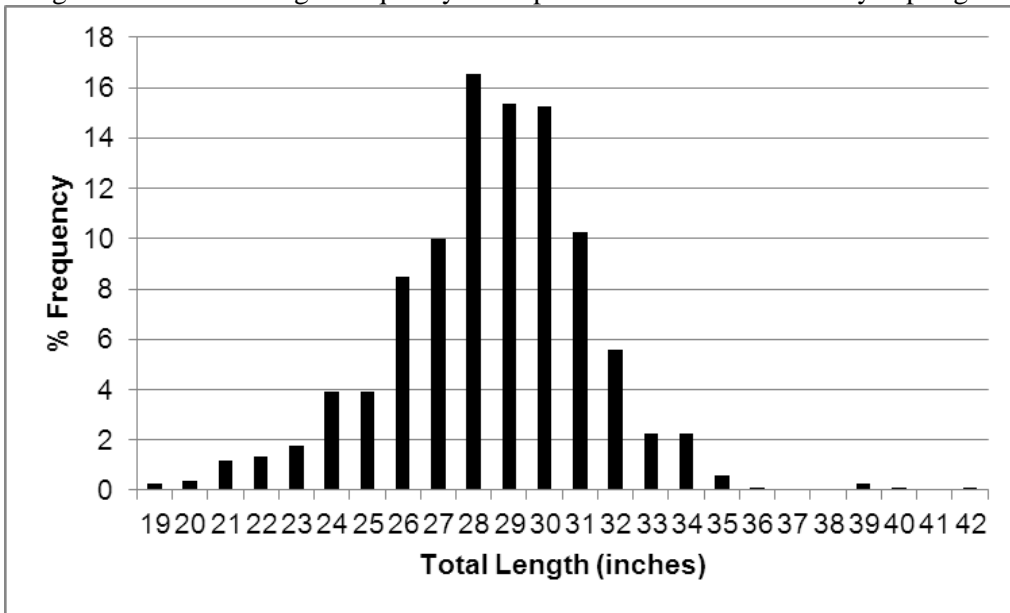


Figure 11. Tag recaptures of striped bass tagged in Delaware Bay: 1989–2011

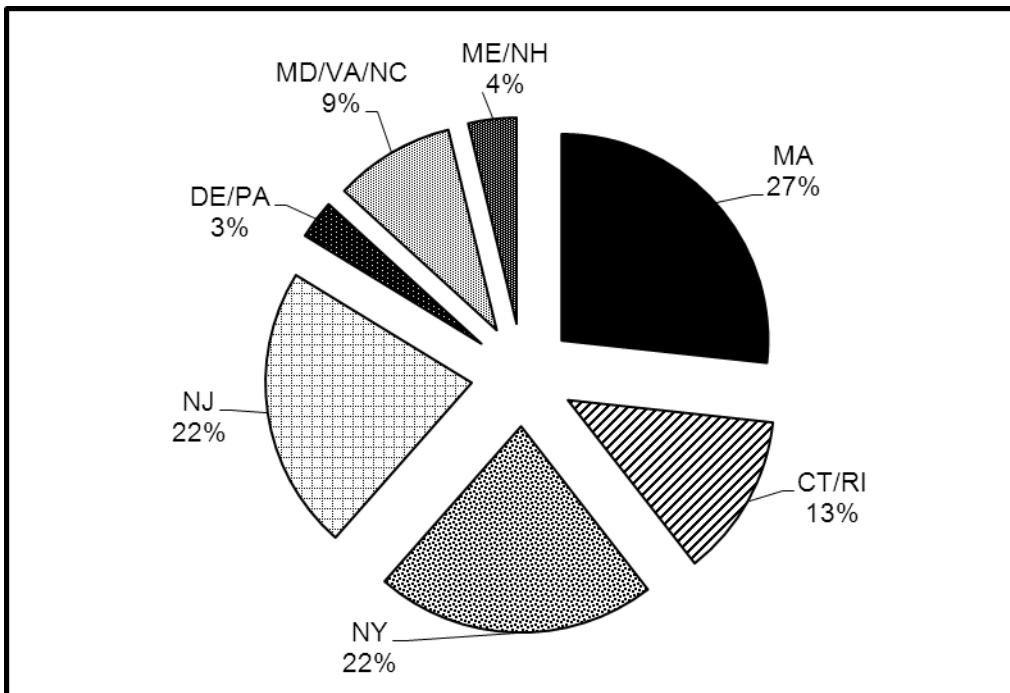
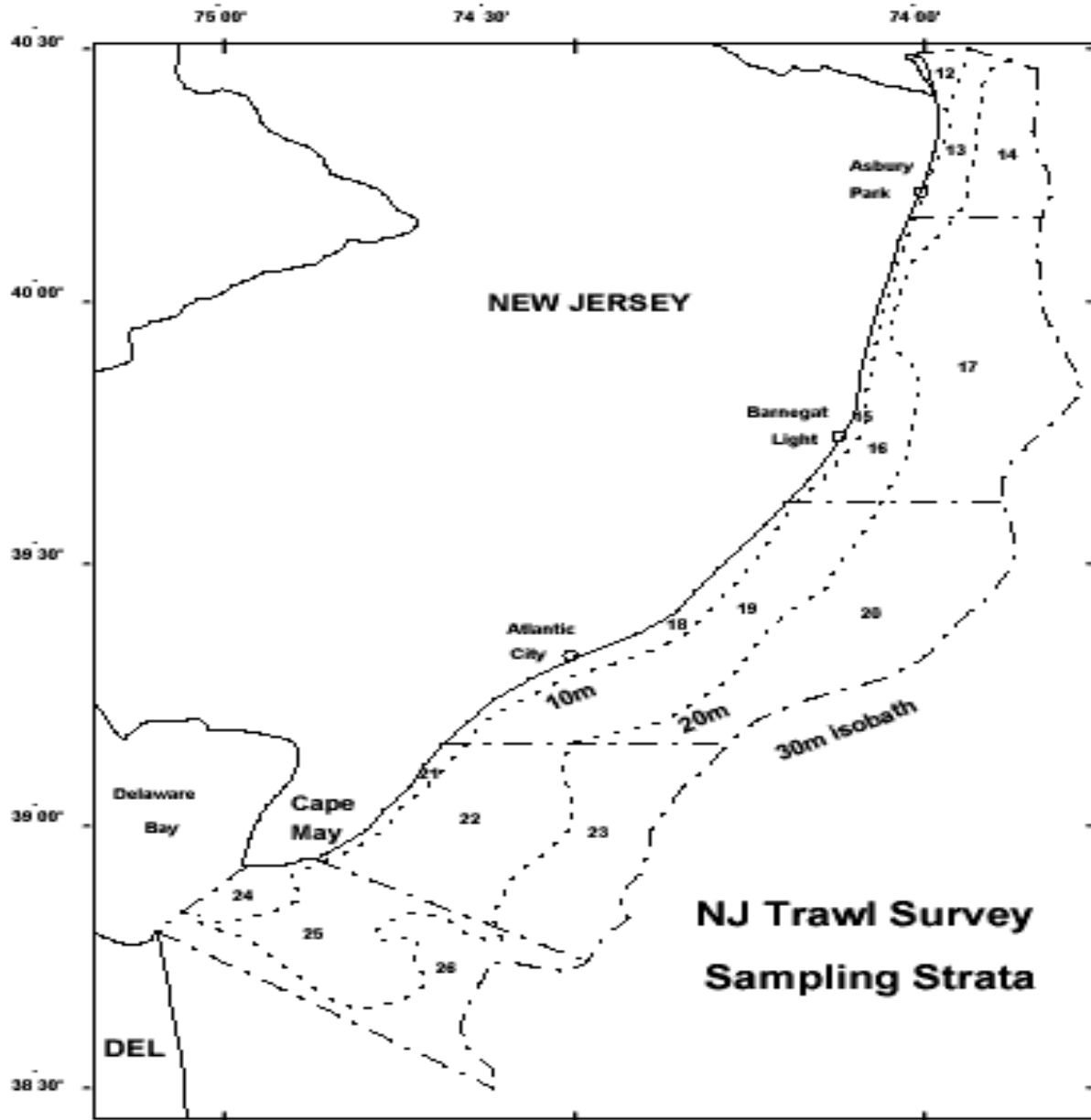


Figure 12. New Jersey Ocean Trawl Survey area: 2011



\* Strata correspond to those of the National Marine Fisheries Service's spring and fall groundfish surveys

Figure 13. April Ocean Trawl Survey number of striped bass caught, by region: 1988-2011

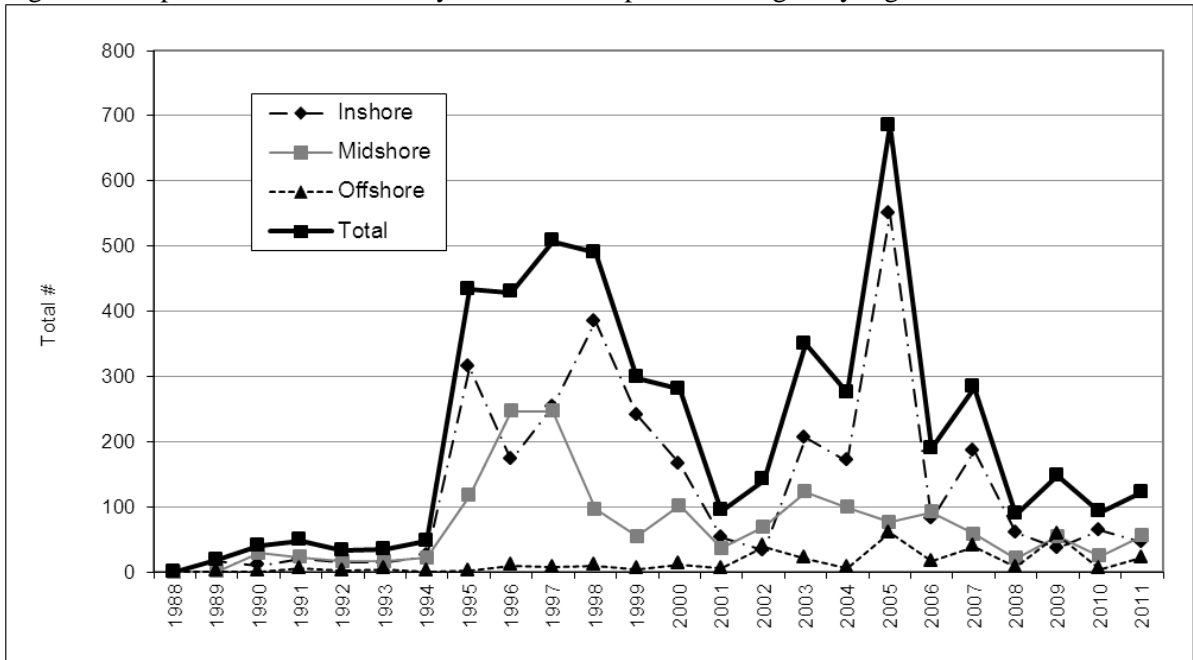
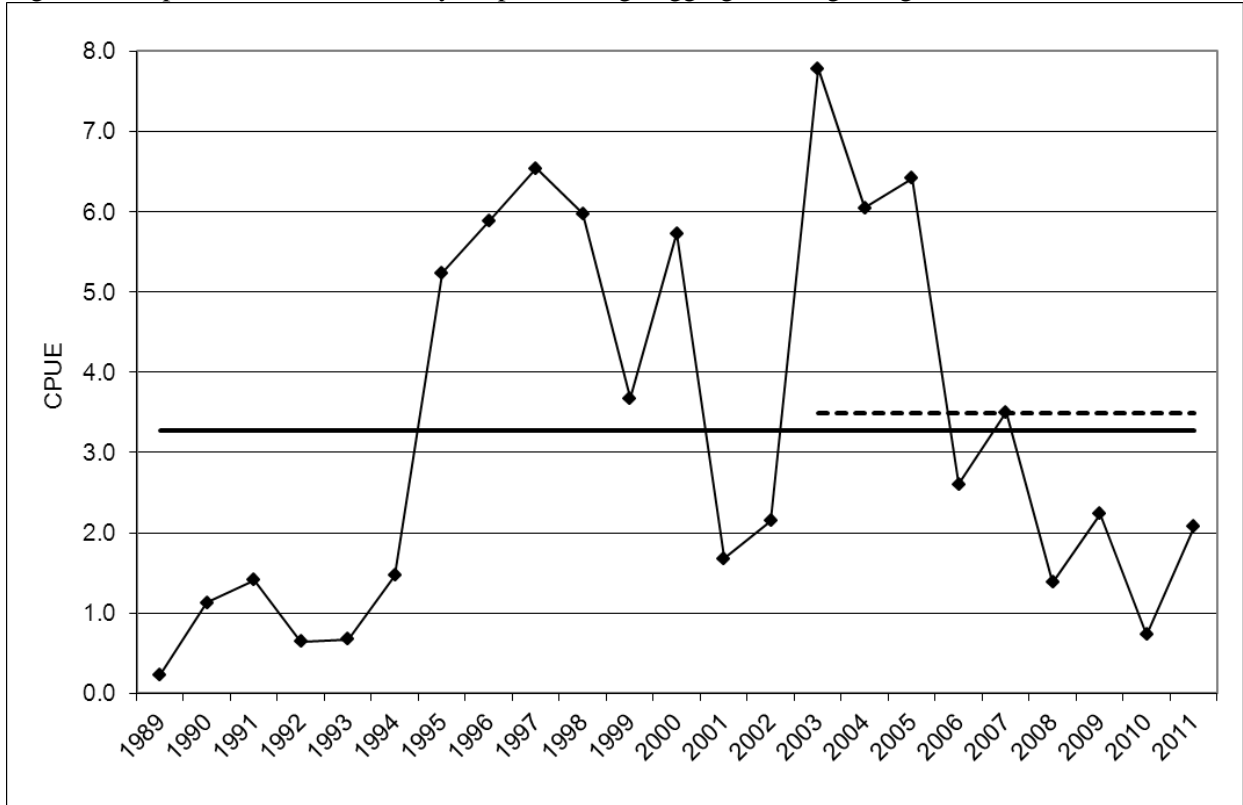


Figure 14. April Ocean Trawl Survey striped bass age-aggregate, weighted geometric mean: 1989-2011



- No offshore strata included
- Solid line indicates time series (1989-2011) average
- Dashed line indicates the last ten years (2002-2011) average

Figure 15. April Ocean Trawl Survey 2008-2011 striped bass age-specific indices

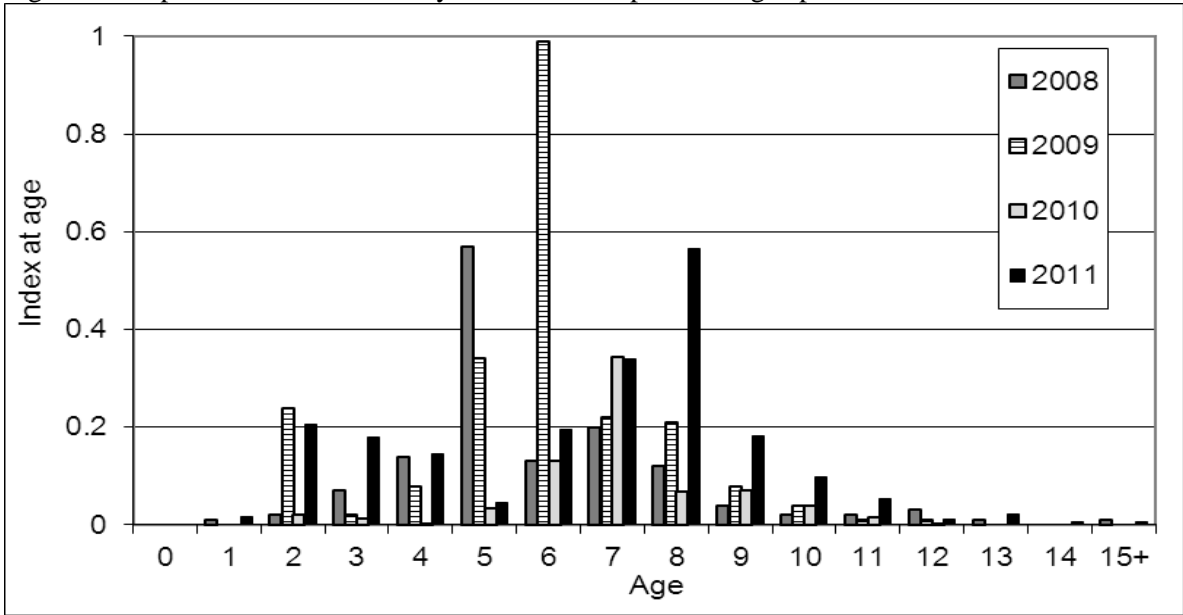
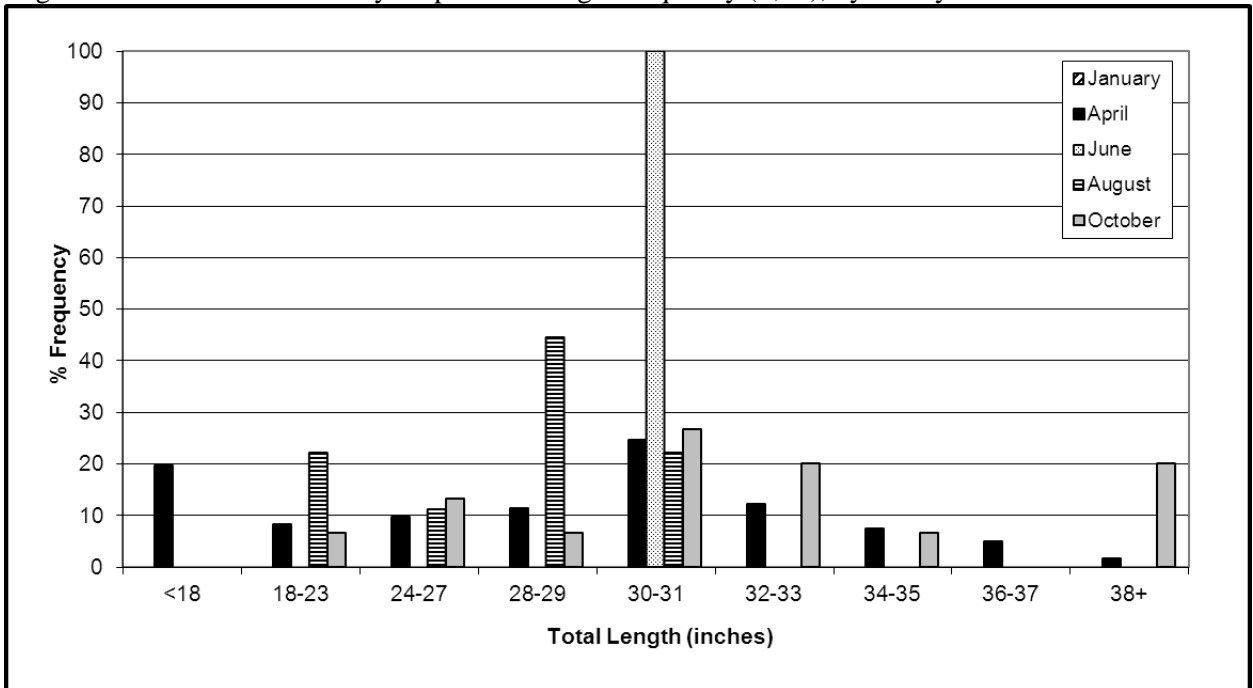


Figure 16. Ocean Trawl Survey striped bass length frequency (tl, in), by survey cruise: 2011



**PENNSYLVANIA  
ANNUAL STATE REPORT FOR STRIPED BASS  
2011**

**Pennsylvania Fish and Boat Commission  
Bureau of Fisheries  
Division of Fisheries Management**

**I. Introduction**

The spawning stock assessment via electrofishing was continued in 2011. Each of the 21 fixed index sites was sampled twice, which represented a return to the standard 1995 through 2003, 2005, 2007, and 2009-2010 sampling design. The temporary sampling of the 21 historic index sites once in 2008, 2006, and 2004 was implemented after ASMFC approval in 2003 in order to free up field time to search for additional sites upstream of the spawning stock assessment area where spawning may also be occurring during the narrow spawning window.

In 2011, the minimum size and daily creel limit remained at 28" and two fish per day, respectively, for the non-tidal portion of the Delaware River and was open to year around fishing. This applied to the segment of the river that extended from the Calhoun Street bridge upstream. The bridge, which connects Morrisville, Pa. with Trenton, NJ, is slightly upstream from Trenton Falls, the head-of-tide, but represented a good line of demarcation for enforcement purposes.

In the tidal portion of the Delaware River (Delaware Estuary) the change in the season and size limits was continued from 2009, the year of implementation. Instead of being closed from January 1 through February 28, and again from April 1 through May 31, the season was opened to year-around fishing. Additionally, a slot limit was in place from April 1 through May 31, which permitted the harvest of two fish per day within the 20 inch to 26 inch length range. During the rest of the year, the size and daily creel limits were 28 inches and two fish per day, respectively. These slot regulations extended from the Pennsylvania/Delaware State line upstream to the Calhoun Street Bridge described above.

**II. Request for *de minimis*, where applicable.**

Pennsylvania does not request *de minimis* status at this time.

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

**A. Fishery Dependent Monitoring Programs**

**i. Commercial Fishery**

(1) Characterization of the commercial fishery

- No commercial fishery for striped bass exists in Pennsylvania, nor may striped bass be taken from the wild and sold, traded, exported, or otherwise offered for sale or barter whether dead or live.

**ii. Recreational Fishery**

(1) Characterization of Recreational fishery

- Minimum length: 28" total length
- Daily bag limit: 2 fish.

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- Seasons: Upstream from Calhoun Street Bridge, just above Trenton Falls– Open year ‘round. From the Pennsylvania/Delaware State line upstream to Calhoun Street Bridge – the above 28 inch minimum length limit, 2 fish per day creel limit regulations apply from June through March. From April 1 through May 31 a 20-26 inch harvestable slot, two fish per day creel limit applies.

(2) Characterization of directed harvest

- No work done in 2011 to characterize recreational harvest.

**iii. Other Losses (Poaching, Hook & Release Mortality, Bycatch, etc.)**

- No work done to characterize losses; however, conservation officers cited anglers for violations that would have represented a maximum detected illegal harvest of 25 striped bass in 2011.

**iv. Total Harvest & Losses**

- Estimates of harvest and other losses were not conducted.

**B. Fishery Independent Monitoring Programs**

- Required Monitoring: Annual spawning stock assessment establishing reliable estimates of abundance (CPUE), age and length distribution, and sex composition for the Delaware River, particularly the stretch from the state line upstream to Poquessing Creek on the Pa. side or just upstream from Rancocas Creek on the NJ side.
- Description of Work Performed: PA Fish and Boat Commission personnel flat bottom boat electrofished 21 fixed striped bass index sites twice within a 28-mile reach of the Delaware River/Estuary from May 12 –May 26. Each electrofishing run was one thousand seconds as recorded on the electrofishing unit. Limitations of the sampling gear and weather dictated the order of sites sampled, as on water travel speed was slow and some sites were unsafe or inefficient to work in windy conditions. Catch per unit effort (CPUE) values were calculated for the index sites. Bass were measured and sexed. Scale samples were removed from a representative number for later aging. When possible and efficient, striped bass greater than or equal to 400 mm in total length were tagged with USFWS internal anchor tags. No additional fish were tagged upstream from the 28 mile reach at Trenton Falls although tagging has frequently occurred at that location in the past.

**i. Results**

(1) Juvenile indices

- (a) Not available

(2) Spawning stock assessment

See attached report prepared by Gregory Murphy and Michael Kaufmann of the Area 6 Fisheries Management Office

- (a) See Figure 3. Length-frequency distribution of male and female striped bass captured from the Delaware Estuary... during May 12 –May 26, 2011 in the attached report.
- (b) See Table 2. Age frequency distribution... in the aforementioned report.
- (c) During the May 12 –May 26, 2011 site index work, male striped bass comprised 73 percent of the fish collected and females 10 percent. Sex was undetermined in 17 percent of fish collected.

(3) Stock characterization

- (a) Not available

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(4) Tagging

- (a) Two hundred and twenty-five striped bass ranging in lengths from 401 mm to 1,080 mm total length were given USFWS internal anchor tags. Male and female striped bass comprised 84 percent and 14 percent of the tagged fish, respectively. Tagged striped bass ranged in ages from 4 to 16 years.

(5) Research Removals

- (a) None

**IV. Planned management programs for the current calendar year (2012)**

**A. Summarize regulations that will be in effect.**

- A 20 to 26 inch harvestable slot limit in conjunction with a two fish per day creel limit will be in effect during April and May, 2012 from the Pennsylvania/Delaware state line upstream to the Calhoun Street Bridge, which is located just upstream from the head-of-tide and joins Morrisville, Pennsylvania with Trenton, New Jersey. Furthermore, a 28 inch minimum length limit and a two fish per day creel limit will be in effect in all other months of the year, and there will be no closed season. Regulations for the rest of the river (upstream from Calhoun Street Bridge) will remain unchanged from the previous 28 inch length limit and two fish per day creel limit with a year around open season.

**B. Summarize monitoring programs that will be performed.**

- Pennsylvania will continue sampling the striped bass spawning stock in 2012 at the 21 fixed index sites with sampling being conducted twice at each fixed site.

**C. Highlight any changes from the previous year.**

- Beginning in 2009 and continuing through 2012 a 20 to 26 inch slot limit and a two fish per day creel limit has been in effect in April and May in the previously seasonally closed portion of the Delaware River Estuary. ASMFC's Striped Bass Management Board approved the proposal on October 20, 2008 followed by approval from the Pennsylvania Fish and Boat Commission's Board of Commissioners in January, 2009. An accelerated PFBC regulatory process allowed the regulations to go into effect in April, 2009.

Michael L. Kaufmann  
June 6, 2012



**DELAWARE'S 2012 STRIPED BASS HARVEST AND COMPLIANCE REPORT TO  
THE ATLANTIC STATES MARINE FISHERIES COMMISSION**

Delaware Division of Fish and Wildlife  
Dover, Delaware

June 15, 2012

Annual report compiled for the Atlantic States Marine Fisheries Commission in accordance with  
Amendment VI of the Striped Bass Management Plan



## **I. Introduction**

Total reported commercial landings for 2011 was 188,620 lbs., which was 98 % of the commercial cap mandated by the ASMFC. Reported commercial gill net and commercial hook and line landings totaled 20,517 striped bass. The average weight of all striped bass landed by commercial fisheries was 9.2 pounds.

Delaware's 2011 recreational total catch of striped bass, including releases, as estimated by MRFSS, was 128,107; this was a 39% increase over the 2010 total catch, but well below the 2002 through 2011 mean annual total catch of 195,081. Total loss from the recreational fishery, including discard mortality, was estimated to be 26,830 fish.

There were no changes to striped bass regulations for 2011. The 2011 regulations appear in Table 1.

## **II. 2011 Fishery and Management Program**

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

#### **i. Commercial Fishery**

##### **1. 2011 Regulations**

###### Seasons

The 2011 spring commercial gill net fishery was open from February 15 through May 31 (Table 1). The gill net quota was 183,775 pounds, 95% of the state commercial quota. If less than 98% of the total gill net quota was landed in the spring season, a fall gill net season would be held from November 15 through December 31 for the remaining quota. The commercial hook and line season ran from April 1 through December 31, with an allocation of 19,345 lbs, 10% of the total quota.

###### Spawning Area Closure

No commercial or recreational harvest was allowed in April and May on the spawning grounds including the Chesapeake and Delaware Canal, the Delaware River north of the Canal, or the Nanticoke River. The Nanticoke River (Delaware's portion)

was open to harvest of striped bass during March, but closed during the spawning season in April and May.

#### Individual Transferable Quota (ITQ) and Tagging Requirements

All licensed gill netters were allocated an equal share of the quota in pounds. The gill net quota (183,775 lbs) was divided by the number of licensed gill netters who applied for quota (111) to establish the ITQ for the spring fishery (1,656 lbs). The individual quotas were transferable, provided the transfer was made prior to the issuance of the tags. The number of tags required to fill an individual quota was estimated by dividing the total quota by the expected average weight of striped bass to be landed for that gear type and season.

All striped bass in the possession of a commercial fisher were required by regulation to have a Delaware Division of Fish and Wildlife (DDFW)-issued numbered tag locked through the jaw and gill. If a commercial fisher needed additional tags to fill his quota, DDFW verified the balance of the quota remaining from reports submitted to DDFW by the weigh stations. All unused tags were returned to DDFW with a written report of landings within 30 days of the closure of the spring and fall fishing seasons.

#### Weigh Station Reporting

Commercial fishers were required to bring all landed striped bass to one of several weigh stations located throughout the state. The weigh-stations recorded the aggregate weight and applied a second locking tag to each striped bass landed. The weigh stations maintained written logs of the date landed, number of fish, total daily weight, and also reported each fisherman's daily catch through an Interactive Voice Reporting (IVR) system.

#### Anticipated Changes To Regulations

No changes in commercial regulations are planned for 2012 at this time.

### **2. 2011 Commercial striped bass harvest**

### **a. Landings and method of estimation**

Harvest was tabulated directly from the mandatory catch reports submitted by the fishermen and compared to the poundage reported by the weigh stations. Fishermen were required to submit daily catch records at the end of the season, and weigh-stations reported each fisherman's harvest at the end of each day. There was no independent verification of the total weights fishermen or weigh stations entered.

Gill net effort was calculated as the average number of yards fished by each fisherman per day, multiplied by the number of days fished.

Total reported commercial landings for 2011 was 188,620 lbs. (Table 1), which was 98 % of the commercial cap mandated by the ASMFC. Reported commercial gill net and commercial hook and line landings totaled 20,517 striped bass. The average weight of all striped bass landed by commercial fisheries was 9.2 pounds.

The reported landings in the spring gill net fishery comprised 20,029 striped bass with a total weight of 181,497 pounds which left 11,950 pounds remaining of the gill net quota (Tables 1 and 2). The reported spring gill net landings represented 94 % of Delaware's total commercial striped bass landings for 2011. Reported striped bass landings from the Delaware Bay accounted for 92 % of the spring total. There were no spring gill net landings reported for the Atlantic Ocean in 2011.

The spring gill net fishery caught 98% of the quota allotted to the gill net fishery, thus there was no fall gill net fishery in 2011.

The reported landings for the commercial hook and line fishery were 7,123 pounds (Table 1). The reported commercial hook and line catch comprised 4 % of the total 2011 reported striped bass commercial landings. Hook and line reports indicated landings of 488 fish, which results in an estimated mean weight of 14.6 lbs.

### **b. Catch composition**

The commercial harvest was sampled for size, age and sex composition by DDFW personnel who visited fish wholesalers as landings arrived. Striped bass were sexed by means of forceps, measured for total length, and weighed (kilograms). Scale samples were removed for age determination. For both the spring gill net landings and

the fall gill net and hook and line fisheries, samples were used to estimate the age distribution of all fish using the proportions at age.

The age and length frequency distributions of the spring landings were determined from age and size samples obtained from 148 striped bass sampled at commercial fish houses.

Sampled striped bass ages ranged from 3 to 11 years (Table 3). The dominant age classes were 7, 8 and 9, which accounted for 68% of the aged samples.

The minimum legal commercial length limit was 20 inches (508 mm) with no maximum length. Sampled fish ranged from 520 mm (20.5") to 955 mm (37.6"), with a mean length of 716 mm (28.2") and from 2.12 kg (4.67 lbs.) to 12.26 kg (27.00 lbs.) with a mean weight of 4.71 kg (10.38 lbs.) (Table 3).

Sixty four of the sexed striped bass were female (85%) and 12 were male (15%).

### **c. Effort**

The spring 2011 gill net fishery had 391 trips taken and 131,500 yards of net fished (Table 1). Catch per unit effort was 53.56 fish landed per trip (Table 2).

The 2011 commercial hook and line fishery had 43 trips taken targeting striped bass (Table 1). There were 10.2 striped bass caught per trip, but this is an over estimate since it does not account for trips with no striped bass of legal size were landed.

## **ii. Recreational Fishery**

### **1. Regulations**

The creel limit was two fish per day with a minimum size of 28" TL, except for July and August. During those months, in the Delaware River, Bay, and tributaries thereof, a slot limit of 20"-26" was in effect, again with a two fish creel limit. No harvest was allowed in April and May from the spawning grounds in the Delaware River, Chesapeake and Delaware Canal, or the Nanticoke River. These regulations do not prohibit catch-and-release fishing on the spawning grounds, but the use of circle hooks is required when using bait.

### **2. 2011 Recreational Harvest**

#### **a. Landings and method of estimation**

Delaware obtained recreational harvest estimates from the Marine Recreational Fisheries Statistics Survey (MRFSS), which was augmented to three times the base level by DDFW funding. The length frequency distribution by wave (two month period) was combined with age-length data from the Division's spring electrofishing survey on the spawning grounds, samples of the commercial gill net landings and the DDFW's research trawl survey of Delaware Bay to establish catch at age estimates for the Delaware recreational fishery spring landings. Biological samples from the summer slot season were collected by DDFW staff and each sample, in addition to be measured and weighed, was sexed and had both otoliths and scales collected for aging. Biological samples from the fall recreational landings were collected for DDFW by a bait-and-tackle shop in Lewes, Delaware. In addition to length and weight measurements, scales were taken from each sampled striped bass, then otoliths were removed and each sampled striped bass was both scale and otolith aged. These estimates were included in the catch-at-age matrix employed in the statistical catch-at-age model of the ASMFC Striped Bass Stock Assessment Subcommittee.

#### **b. Catch composition**

The estimated total number of striped bass caught in 2011 was 128,107 (Table 4). The MRFSS estimates of total number caught (including live releases) increased from 421 fish in 1990 to a peak of more than 277,727 in 2008. The 2011 estimated total number caught was below the time-series annual mean of 152,827.

The 2011 estimated number harvested was 18,023 fish, a 23% decrease from 2010 and the 2011 estimated landed weight was 241,149 lbs. (Table 4), a 26% increase from 2010. The 2011 estimated number released, 110,084 striped bass (Table 4), was below the time-series annual mean of 135,576.

The age and sex of two summer slot season striped bass were determined by DDFW.

One of the sampled slot season striped bass was age 3 and the other was age 4. Both of the sampled fish were male.

The age and length frequency distributions of fall recreational striped bass landings were determined from size and age samples obtained from 82 fish racks kept for DDFW by a Lewes bait-and-tackle shop.

The ages of the fall recreational striped bass ranged from 7 to 18, but ages 9 through 12 accounted for 62% of the aged samples (Table 5).

The fall recreational striped bass ranged in total length from 757 mm (30") to 1,041 mm (41"), and the mean length was 961 mm (38") (Table 5).

**c. Effort**

Delaware did not collect data on recreational fishing trips targeting striped bass.

iii. **Other losses**

Commercial drift gill-netters reported discarding 61 (Table 1) striped bass during the 2011, but the discard mortality rate for drift gill-caught striped bass in a Delaware study was close to zero (Clark and Kahn 2009). Commercial anchor gill-netters reported discarding 845 striped bass during 2011 (Table 1), resulting in an estimated 346 dead discarded striped bass using an anchor net discard mortality rate of 0.41 (Clark and Kahn 2009). Commercial hook and line fishers reported discarding 96 striped bass in 2011 (Table 1), resulting in an estimated 8 dead discarded striped bass, using a hook and release mortality rate of 0.08 (Northeast Fisheries Science Center 2008).

The recreational fishery released an estimated 110,084 striped bass in 2011 (Table 4), resulting in an estimate of 8,806 striped bass dying after release, using the hook and release mortality rate of 0.08 (Northeast Fisheries Science Center 2008).

Several of the large industrial operations (e.g. power plants, refineries, chemical plants) situated along the Delaware River near striped bass spawning grounds use large volumes of Delaware River water for cooling and often kill many young-of-the-year striped bass during normal operations. The impact of these losses on the striped bass population was not determined.

iv. **Total Harvest and Losses**

The number of striped bass harvested or killed in Delaware during 2011 was 20,871 for all commercial fisheries combined and 26,830 for the recreational fishery.

The estimated total weight harvested or killed in Delaware during 2011 was 189,842 lbs. for all commercial fisheries combined and 260,441 lbs. for the recreational fishery.

## **B. Fishery Independent Monitoring Programs**

### **i. Spawning stock biomass survey**

The 2011 spawning stock biomass survey for the Delaware River will be submitted when complete.

## **III. Planned management programs for this year**

No changes are anticipated to Delaware's striped bass regulations or monitoring programs in the current year.

## **References**

Clark, J. H. and D. M. Kahn. 2009. Amount and disposition of striped bass discarded in Delaware's spring striped bass gill-net fishery during 2002 and 2003: effects of regulations and fishing strategies. *North American Journal of Fisheries Management* 29:576-585.

Northeast Fisheries Science Center. 2008. 46th Northeast Regional Stock Assessment Workshop (46th SAW). 46th SAW assessment summary report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-01; 24 p.

Table 1. Reported commercial striped bass harvest from Delaware, in pounds and number, estimated number discarded and total number caught, by gear type and area fished in 2011. Unspecified Delaware Bay landings were included with Middle Delaware Bay landings.

Pounds Landed

Location	Gill Net			Hook and Line	Combined
	Spring	Fall	Total		
Delaware River	8,082		8,082	*	*
Upper Delaware Bay	84,471		84,471	1,753	86,224
Middle Delaware Bay	68,262		68,262	1,762	70,024
Lower Delaware Bay	13,247		13,247	1,353	14,600
<b>Delaware Estuary Total:</b>	<b>174,062</b>		<b>174,062</b>	*	*
Nanticoke River	5,727		5,727	146	*
<b>Producer Area Total:</b>	<b>179,789</b>	<b>0</b>	<b>179,789</b>	<b>5,023</b>	<b>184,812</b>
Atlantic Ocean	*		*	721	*
Indian River and Bay	*		*	974	*
Unspecified Areas	*		*	*	*
<b>Other Areas Total:</b>	<b>1,708</b>	<b>0</b>	<b>1,708</b>	<b>2,100</b>	<b>3,808</b>
<b>Statewide Total:</b>	<b>181,497</b>	<b>0</b>	<b>181,497</b>	<b>7,123</b>	<b>188,620</b>

\* Denote values that cannot be shown per Delaware State Code (Title 7 § 903) regarding confidentiality of landings.



Number Landed

Location	Gill Net			Hook and Line	Combined
	Spring	Fall	Total		
Delaware River	906		906	1	1
Upper Delaware Bay	8,975		8,975	129	9,104
Middle Delaware Bay	7,969		7,969	117	8,086
Lower Delaware Bay	1,545		1,545	85	1,630
<b>Delaware Estuary Total:</b>	<b>19,395</b>		<b>19,395</b>	<b>332</b>	<b>19,727</b>
Nanticoke River	478		478	6	484
<b>Producer Area Total:</b>	<b>19,873</b>	<b>0</b>	<b>19,873</b>	<b>338</b>	<b>20,211</b>
Atlantic Ocean	*		*	55	*
Indian River and Bay	*		*	60	*
Unspecified Areas	*		*	*	*
<b>Other Areas Total:</b>	<b>156</b>	<b>0</b>	<b>156</b>	<b>150</b>	<b>306</b>
<b>Statewide Total:</b>	<b>20,029</b>	<b>0</b>	<b>20,029</b>	<b>488</b>	<b>20,517</b>

\* Denote values that cannot be shown per Delaware State Code (Title 7 § 903) regarding confidentiality of landings.

Number Discarded

Location	Gill Net			Hook and Line	Combined
	Spring	Fall	Total		
Delaware River	5		5	0	5
Upper Delaware Bay	366		366	27	393
Middle Delaware Bay	370		370	53	423
Lower Delaware Bay	104		104	16	120
<b>Delaware Estuary Total:</b>	<b>845</b>	<b>0</b>	<b>845</b>	<b>96</b>	<b>941</b>
Nanticoke River	56		56	0	56
<b>Producer Area Total:</b>	<b>901</b>	<b>0</b>	<b>901</b>	<b>96</b>	<b>997</b>
Atlantic Ocean				3	3
Indian River and Bay	*		*	*	14
Unspecified Areas	*		*	*	*
<b>Other Areas Total:</b>	<b>14</b>	<b>0</b>	<b>14</b>	<b>3</b>	<b>17</b>
<b>Statewide Total:</b>	<b>915</b>	<b>0</b>	<b>915</b>	<b>99</b>	<b>1,031</b>

\* Denote values that cannot be shown per Delaware State Code (Title 7 § 903) regarding confidentiality of landings.

Total Number Caught  
(Landings plus discards)

Location	Gill Net			Hook and Line	Combined
	Spring	Fall	Total		
Delaware River	911		911	1	912
Upper Delaware Bay	9,341		9,341	156	9,497
Middle Delaware Bay	8,339		8,339	170	8,509
Lower Delaware Bay	1,649		1,649	101	1,750
<b>Delaware Estuary Total:</b>	<b>20,240</b>		<b>20,240</b>	<b>428</b>	<b>20,668</b>
Nanticoke River	534		534	6	540
<b>Producer Area Total:</b>	<b>20,774</b>	<b>0</b>	<b>20,774</b>	<b>434</b>	<b>21,208</b>
Atlantic Ocean	*	*	*	3	3
Indian River and Bay	*	*	*	*	*
Unspecified Areas	*	*	*	*	*
<b>Other Areas Total:</b>	<b>170</b>	<b>0</b>	<b>170</b>	<b>3</b>	<b>173</b>
<b>Statewide Total:</b>	<b>20,944</b>	<b>0</b>	<b>20,944</b>	<b>437</b>	<b>21,381</b>

\* Denote values that cannot be shown per Delaware State Code (Title 7 § 903) regarding confidentiality of landings.

Total Effort (Trips)

Location	Gill Net			Hook and Line	Combined
	Spring	Fall	Total		
Delaware River	33		33	*	*
Upper Delaware Bay	153		153	18	171
Middle Delaware Bay	135		135	29	164
Lower Delaware Bay	47		47	14	61
<b>Delaware Estuary Total:</b>	<b>368</b>		<b>368</b>	*	*
Nanticoke River	9		9	*	*
<b>Producer Area Total:</b>	<b>377</b>	<b>0</b>	<b>377</b>	<b>63</b>	<b>440</b>
Atlantic Ocean	*		*	5	*
Indian River and Bay	*		*	11	*
Unspecified Areas	*		*	*	*
<b>Other Areas Total:</b>	<b>14</b>	<b>0</b>	<b>14</b>	*	<b>31</b>
<b>Statewide Total:</b>	<b>391</b>	<b>0</b>	<b>391</b>	<b>80</b>	<b>471</b>

\* Denote values that cannot be shown per Delaware State Code (Title 7 § 903) regarding confidentiality of landings.

Total Net Yards

Location	Gill Net			Hook and Line	Combined
	Spring	Fall	Total		
Delaware River	10,350		10,350		10,350
Upper Delaware Bay	41,640		41,640		41,640
Middle Delaware Bay	45,900		45,900		45,900
Lower Delaware Bay	30,900		30,900		30,900
<b>Delaware Estuary Total:</b>	<b>128,790</b>		<b>128,790</b>		<b>128,790</b>
Nanticoke River	2,710		2,710		2,710
<b>Producer Area Total:</b>	<b>131,500</b>	<b>0</b>	<b>131,500</b>		<b>131,500</b>
Atlantic Ocean	*		*		*
Indian River and Bay	*		*		*
Unspecified Areas	*		*		*
<b>Other Areas Total:</b>	<b>13,300</b>	<b>0</b>	<b>13,300</b>		<b>13,300</b>
<b>Statewide Total:</b>	<b>144,800</b>	<b>0</b>	<b>144,800</b>		<b>144,800</b>

\* Denote values that cannot be shown per Delaware State Code (Title 7 § 903) regarding confidentiality of landings.

Table 2. Reported gill net fishing effort, landings and catch per unit effort for the 2011 spring and fall gill net fisheries.

	<u>SPRING</u>
No. of trips <sup>1</sup>	391
Net-Yards	144,800
Total catch	20,944
Catch/trip	53.56
	<u>FALL</u>
No. of trips	-
Yard-days	-
Total Catch	-
Catch/trip	-

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<sup>1</sup>The number of man-days was based on the number of days when striped bass landings occurred, not necessarily the total number of days of fishing effort.

Table 3. Age distribution and length at age of striped bass sampled from the 2011 spring gill net fishery (n=148).

Age	FL mean(mm)	Minimum FL (mm)	Maximum FL (mm)	Number at age	Percent of total sampled
5	610	556	716	4	2.70%
6	669	558	727	13	8.78%
7	738	590	883	29	19.59%
8	761	604	843	33	22.30%
9	799	685	978	38	25.68%
10	787	704	889	22	14.86%
11	840	720	1005	8	5.41%
12	747	747	747	1	0.68%

Table 4. Delaware recreational striped bass estimates from 1990 through 2011: number caught, number released, number landed, weight landed and number released dead.

Year	Total Number Caught	PSE	Number Harvested	Number Released (B2)	H&L Release Mortality	Total Losses (number)	Pounds Landed
1990	16,421	22.7	2,009	14,411	1,153	3,162	18,115
1991	41,075	21.5	2,741	38,334	3,067	5,808	25,501
1992	39,332	24.6	2,400	36,932	2,955	5,354	25,677
1993	93,599	23.4	4,055	89,543	7,163	11,219	52,540
1994	108,131	21.6	4,140	103,992	8,319	12,459	63,832
1995	130,725	17.8	15,361	115,363	9,229	24,590	175,347
1996	122,240	12.6	22,867	99,372	7,950	30,817	281,481
1997	149,779	20.1	19,706	130,073	10,406	30,112	232,186
1998	203,774	13.6	18,758	185,016	14,801	33,559	236,926
1999	114,469	18.8	8,772	105,696	8,456	17,228	100,541
2000	191,381	12	39,543	151,838	12,147	50,886	346,905
2001	203,872	15	41,195	162,677	13,014	54,219	382,498
2002	143,799	9.7	29,149	114,650	9,172	38,689	299,561
2003	194,708	11.5	29,101	169,012	13,521	42,350	303,909
2004	176,652	11.2	23,849	152,803	12,224	36,073	288,650
2005	242,376	13.7	19,977	222,399	17,792	37,769	254,466
2006	256,128	12.9	17,804	238,324	19,065	36,869	190,943
2007	261,168	14.1	10,095	251,073	20,085	30,180	112,071
2008	277,727	12.6	16,994	260,733	20,858	37,852	209,995
2009	174,319	13.1	21,762	152,557	12,205	33,967	313,268
2010	92,420	13.9	14,622	77,799	6,224	20,846	191,355
2011	128,107	18.6	18,023	110,084	8,807	26,830	241,149



Table 6. Age distribution and length at age of striped bass sampled from the 2012 fall recreational fishery (n=82).

Age	Number at age	Mean TL (mm)	Minimum TL (mm)	Maximum TL (mm)	Percent of total sampled
7	3	862	795	914	3.7%
8	5	891	757	1,016	6.1%
9	13	925	850	991	15.9%
10	14	924	813	1,003	17.1%
11	9	936	838	1,041	11.0%
12	15	984	914	1,067	18.3%
13	7	987	749	1,105	8.5%
14	3	1,045	1,003	1,092	3.7%
15	7	1,023	902	1,105	8.5%
16	4	1,080	965	1,143	4.9%
17	1	1,016	1,016	1,016	1.2%
18	1	1,041	1,041	1,041	1.2%

**Maryland Striped Bass (*Morone saxatilis*) Compliance Report  
to the  
Atlantic States Marine Fisheries Commission  
2011**

**Prepared by**

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Jeffrey Horne  
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**Fisheries Service  
Maryland Department of Natural Resources**

**June, 2012**

## I. Introduction

Maryland's combined Chesapeake Bay and Atlantic Ocean 2011 striped bass quota was 4.7 million pounds. Maryland's recreational fishing seasons were open for approximately 34 weeks in Chesapeake Bay, and year-round in Atlantic coastal waters. Maryland's recreational landings for 2011 are estimated at 2,637,719 pounds in Chesapeake Bay and 2,590 pounds in the Atlantic Ocean (MRIP). Maryland completed its thirteenth commercial fishing year utilizing a quota system. Commercial seasons were open for 36 weeks in Chesapeake Bay (January-February, June-December), and 24 weeks in the Atlantic Ocean (January-April, Nov-Dec). Commercial landings were reported at 1,955,072 pounds in Maryland's Chesapeake Bay and 21,401 pounds on the Atlantic Coast.

## II. Request for *de minimis*, where applicable.

N/A

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

### A. Fishery Dependent Monitoring Programs

#### i. Commercial Fishery

##### (1) Characterization of the commercial fishery

- The 2011 Chesapeake Bay commercial quota was 1,963,873 lbs, a 7% decrease from 2010. The Bay quota was further divided among gear types as follows: drift gill net, 883,743 lbs; hook and line, 589,162 lbs; pound net/haul seine, 490,968 lbs. Gear-specific quotas were adjusted throughout the year as progress toward the Bay quota was monitored. State jurisdictional waters on the Atlantic coast were allotted a quota of 126,396 lbs.
- In Chesapeake Bay each commercial gear type had a specified season:
  - i. The **pound net** fishery was open from June 1 through November 30, 2011, Monday-Saturday.
  - ii. The **haul seine** fishery was open from June 7 through November 30, 2011, Monday-Friday
  - iii. The **hook and line** fishery operated from June 7 through November 30, 2011, Monday-Thursday only.
  - iv. The **drift gill net** fishery was open during the periods January 1 through February 28 and December 1 through 31, 2011, Monday-Friday.
- The Atlantic Coast drift gill net/otter trawl fishery was open during the periods January 1 through April 30 and November 1 through December 31, 2011, Monday-Friday.
- The commercial striped bass fishery in Chesapeake Bay operated under an 18-36 inch (TL) slot limit. The commercial fishery on the Atlantic coast operated under a 24 inch (TL) minimum size limit.
- A summary of Maryland's 2011 commercial striped bass regulations is provided in Table 1 and in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: State Regulations).

## (2) Characterization of directed commercial harvest

### (a) Landings and method of estimation

- The Maryland Department of Natural Resources (MD DNR) solicited cooperation from licensed seafood dealers throughout the state to act as check stations. Check stations were responsible for counting and weighing each fisherman's catch and certifying the daily harvest data on the individual fisherman's harvest permit. All commercially harvested striped bass were required to pass through a check station prior to sale. Check stations provided a weekly report detailing daily fishing activities of each checked permittee. Reported landings (pounds) were calculated from these weekly reports. Mean weights were determined from samples taken by MD DNR biologists at commercial check stations. Landings in numbers were estimated by dividing reported monthly landings in pounds by monthly mean weights.
- Commercial landings by gear are presented in Table 2. In Chesapeake Bay 488,897 striped bass weighing 1,955,072 pounds were harvested in 2011 (Gill net: 192,388 fish, 865,537 lbs.; Pound Net/Haul Seine: 167,034 fish, 648,113 lbs; Hook and Line: 129,475 fish, 441,422 lbs). In Atlantic waters 2,072 striped bass weighing 21,401 pounds were harvested. The time series of Maryland Chesapeake Bay commercial landings in numbers and pounds is presented in Table 3 and in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Comm Lnd # by State, Comm Lnd Wt by state).

### (b) Catch composition

- Landings at striped bass check stations were sampled according to a stratified random design. Strata were defined as high-, medium-, or low-use check stations based on the previous year's reported landings. High-use and medium-use check stations were sampled at a ratio of approximately 3:1, at an intensity of 1 visit per week. Days and check stations were randomly selected each month. At each check station, fish were measured (mm TL) and weighed (kg). Scales were taken from two fish per 10 mm length group and from all fish greater than 700 mm TL.
- Analysis
  - (i) Age frequency
    - The number of age samples for each fishery is presented in Table 4 and in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Comm-Atl Gill net Trawl, Comm-Bay Gill net, Comm-Bay Hook and Line, Comm-Bay Pound Net).
    - Age length keys for each fishery are provided in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Comm-Atl Gill net Trawl, Comm-Bay Gill net, Comm-Bay Hook and Line, Comm-Bay Pound Net).
    - Age expansions of the total landings are provided in Table 5a (numbers of fish) and Table 6a (pounds), and in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Catch-at-age Summary).

- Mean length-at-age with confidence intervals for fish sampled from the hook and line/pound net and drift gill net fisheries are provided in Tables 7 and 8, respectively.
  - Mean weight-at-age as calculated by the Compliance Report template provided by the Atlantic States Marine Fisheries Commission (ASMFC) is presented in Table 9 and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Catch-at-age Summary).
- (ii) Length frequency
- The number of length samples for each fishery is provided in Table 4. Length frequencies and number of length samples for the commercial fisheries are provided in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Comm-Atl Gill net Trawl, Comm-Bay Gill net, Comm-Bay Hook and Line, Comm-Bay Pound Net).
- (iii) Sex Ratio
- Commercial sex ratios have not been investigated since winter 2007-2008. Time series data for all sex ratio investigations are presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Comm-Sex Ratio).
- (c) Estimation of effort
- Total commercial effort in 2011 was determined from monthly fishing activity reports submitted to the Department by licensed fishermen. Total commercial effort by striped bass permit holders was estimated at 5,951 days (Chesapeake Bay 5,816; Atlantic 135). In Chesapeake Bay, pound net/haul seine effort was 1,661 days, hook and line effort was 1,972 days, and drift gill net effort was 2,180 days. In the Atlantic Ocean, gill net effort was 120 days and trawl effort was 15 days. Effort was defined as days when striped bass landings were reported by gear type.
- (d) CPUE
- Commercial CPUE as fish per day was 83 in 2011, compared to 89 in 2010. CPUE as pounds per day was 332 in 2011, compared to 326 in 2010.
- (e) Losses
- Commercial discards are estimated bay wide by the Striped Bass Stock Assessment Committee. No Maryland-specific commercial discard data are included in this report.

## **ii. Recreational Fishery**

### **(1) Characterization of recreational fishery**

- Maryland's 2011 Chesapeake Bay recreational quota of 2,657,102 pounds for resident striped bass was a 7% decrease from 2010.
- The estimate of migratory harvest is reported to ASMFC separately (Appendix 1: Estimate of the 2011 Harvest of Spring Coastal Migrant Striped Bass Striped Bass in Chesapeake Bay. Report to the Striped Bass Technical Committee. Horne, J., 2011). Landings reported here are for migratory and resident fish combined.

- Maryland's 2011 Chesapeake Bay recreational striped bass fishery was divided into three distinct segments:
  - **Susquehanna Flats; Catch and Release** (March 1-May 3), **Catch and Keep** (May 16-May 31, 18-26 inches TL, one fish per person, per day) **seasons:** upstream of a line from Sandy Point to Turkey Point and the Susquehanna River downstream from a line connecting the Susquehanna State Park boat ramp in Lapidum to Twin Rocks to Tomes Wharf in Port Deposit, and the Northeast River. The Susquehanna River is closed to this fishery. Non-offset circle hooks are required when fishing with baited hooks with a gap larger than 0.5 inches. Eels prohibited.
  - **Spring Trophy season:** April 16-May 15; one fish per person, per day; 28 inches (TL) minimum ; fish may be harvested only in the main-stem Bay from Brewerton Channel (Baltimore) to the MD/VA line, excluding all tributaries, bays, creeks, rivers, and sounds except Tangier and Pocomoke Sounds. Eels prohibited.
  - **Summer-Fall Recreational/Charter Boat season:** Two fish per person, per day at 18-28 inches (TL) **or** one fish per person, per day, at 18-28 inches (TL) and one fish greater than 28 inches (TL) per person, per day. Eels prohibited before June 1. Boundaries changed according to the following schedule: *May 16- May 31*, fish may be harvested only in the main-stem Bay below Hart-Miller Island (Baltimore) to the MD/VA line, and the lowermost five miles of the Chester, Choptank, and Patuxent Rivers. All other tributaries, bays, creeks, rivers, and sounds closed except Tangier and Pocomoke Sounds. *June 1-December 15*, Bay and all tributaries open.
- Maryland's 2011 Atlantic Coast recreational fishery was open from January 1 through December 31, with a two fish per person, per day creel limit and a 28 inch (TL) minimum size limit.
- A summary of Maryland's 2011 recreational striped bass regulations appears in Table 10 and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: State Regulations).

(2) Characterization of directed harvest

(a) Landings and method of estimation

- Estimates of the total catch, harvest, and associated statistics for the recreational/charter boat fishery were taken directly from the NOAA Marine Recreational Information Program (MRIP). Note that the recreational/charter boat harvest reported as being taken in the Potomac River, and landed in Maryland, is included in Maryland's recreational/charter boat harvest estimates.
- MRIP estimates are from a May 8, 2012 query.
- MRIP/MRFSS comparisons for 2004-2011 are presented in Tables 11-13 and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: MRIP MRFSS comparison).
- Recreational catch-at-age estimations for 2004-2010 were re-calculated using the new MRIP harvest and discard estimates and submitted to ASMFC as an Excel file supplemental to this report (Excel file: MDCompReports2004-2010MRIP.xls).
- Maryland's total recreational harvest in 2011 is estimated at 445,170 fish (Chesapeake Bay: 444,915; Atlantic: 255) or 2,640,309 pounds (Chesapeake Bay: 2,637,719; Atlantic: 2,590) (MRIP). The compliance report template

- estimates recreational harvest in the same period at 2,690,314 pounds (Chesapeake Bay: 2,687,490; Atlantic: 2,823) using MRIP length frequencies and seasonal MD DNR length-weight regression parameters.
- Recreational harvest by MRIP wave (two-month sampling period) is presented in Table 14.
  - The time series of recreational landings is presented in Table 15 and in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Rec-Ind # by State, Rec-Ind Wt by State).
- (b) Age composition of recreational catch
- Length frequencies and estimates of the total catch by wave were taken from MRIP. The summary of the recreational catch-at-age is presented in Tables 5a (numbers of fish) and 6a (pounds). The recreational catch-at-age by area and season is presented in Table 16. Detailed development of the recreational catch-at-age is presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Rec-Harvest Wave 2 CB, Rec-Harvest Wave 3 CB, Rec-Harvest Waves 4-6 CB, Rec-Harvest Atlantic).
    - (i) Age frequency
      - Chesapeake Bay age-length keys (ALK) were developed for three periods and applied to landings to develop catch-at-age by season. The overall recreational catch-at-age was calculated as the sum.
        - Wave 2: ALK was developed from pooled spring gill net survey/creel survey data (n=561).
        - Wave 3: ALK was developed from pooled spring gill net survey/creel survey data (n=560).
        - Waves 4-6 combined: ALK was developed from June-November commercial check station data and spring gill net survey/creel survey data where needed (n=261).
      - An ALK for the Atlantic coast was developed from commercial check station data supplemented with spring gill net/creel survey data (n=97).
    - (ii) Length frequency
      - Chesapeake Bay recreational harvest length frequencies (LF) were developed for three periods and applied to landings to develop catch-at-age by season.
        - Wave 2: LF was developed from Volunteer Charter Boat Survey data (n=3,152).
        - Wave 3: LF was developed from MRIP raw intercept data (n=279).
        - Waves 4-6 combined: LF was developed from MRIP raw intercept data (n=646).
      - The Atlantic coast recreational harvest LF was developed from charterboat and recreational angler logbook data supplied by NJDEP Division of Fish and Wildlife (n=4,984; Heather Corbett, personal communication).
      - Expanded length frequencies (relative length frequency multiplied by the harvest) are presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Rec-

Harvest Wave 2 CB, Rec-Harvest Wave 3 CB, Rec-Harvest Waves 4-6 CB, Rec-Harvest Atlantic).

- (c) Sex ratio of the recreational catch was only available for the 2011 spring trophy fishery. The sampled catch was 79% female when fish of indeterminate sex were excluded.
- (d) Estimation of effort
  - Estimates targeted striped bass trips for 2011 were not available at the time of this writing. For the period 2008-2010 targeted striped bass trips averaged 33% of all Chesapeake Bay trips and 27% of all trips on Maryland's Atlantic coast. Number of trips by area and wave are presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Rec-Effort).

### iii. Other Losses

- (1) Estimates of recreational discards were taken directly from MRIP (date of query: May 8, 2012).
  - (a) Maryland striped bass recreational discards (Type B2) are estimated at 1,123,281 fish in Chesapeake Bay, and 1,008 fish on the Atlantic Coast, for a total of 1,124,289 fish statewide (Table 17 and accompanying Excel file, MD\_SB\_Compliance2011.xls: worksheet: Rec-Discards # by State).
  - (b) Recreational discard mortality is calculated as 8% of recreational discards, for a total of 89,943 fish (89,862 in Chesapeake Bay; 81 in the Atlantic) lost to discard mortality in 2011. Recreational discard mortality-at-age is presented in Tables 5b and 18. Discard mortality-at-age is also presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Catch-at-age Summary).
  - (c) The compliance report template estimated 2011 discard mortality weight at 174,437 pounds (173,870 pounds in Chesapeake Bay; 568 pounds in the Atlantic). Detailed discard mortality weight-at-age and total weight are presented in Table 6b and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Catch-at-age Summary).
  - (d) Chesapeake Bay discard mortality weight was estimated using LFs developed from the MD Volunteer Charterboat Survey (waves 2 and 3), the MD Striped Bass Volunteer Angler Survey (Waves 4-6), and seasonal MD DNR length-weight regression parameters.
  - (e) Atlantic discard mortality weight was estimated using a LF developed from charterboat and recreational angler logbook data supplied by NJDEP Division of Fish and Wildlife (Heather Corbett, personal communication) and length-weight regression parameters developed from MDDNR coastal commercial fishery monitoring.
  - (f) Age composition – Detailed development of recreational discard mortality by season is presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheets: Rec-Discards Wave 2 CB, Rec-Discards Wave 3 CB, Rec-Discards Waves 4-6 CB, Rec-Discards Atlantic).
    - (i) Age frequency
      - The same ALKs and seasons used for recreational harvest were applied to Chesapeake Bay discards. ALKs were developed by season and applied to discards to develop discard-at-age by



season. These were added to develop overall recreational discards-at-age.

- Wave 2 Chesapeake Bay: ALK was developed from pooled spring gill net survey/creel survey data (n=601).
- Wave 3 Chesapeake Bay: ALK was developed from pooled spring gill net survey/creel survey data (n=608).
- Waves 4-6 combined Chesapeake Bay: ALK was developed from June-November commercial check station data and spring gill net survey/creel survey data (n=135).
- Atlantic Discards: ALK was developed from commercial Atlantic check station monitoring data supplemented with spring gill net survey data (n=299).

(ii) Length frequencies

- The LF for Wave 2 Chesapeake Bay discards was developed from the Maryland Volunteer Charterboat Survey (n=427).
- The LF for Wave 3 Chesapeake Bay discards was developed from the Maryland Volunteer Charterboat Survey (n=1,859).
- The LF for combined Waves 4-6 Chesapeake Bay discards was developed from the Maryland Striped Bass Volunteer Angler Survey (n=76).
- The LF for Atlantic discards was developed from NJDEP Division of Fish and Wildlife angler logbook data (n=5,034).

**iv. Total Harvest & Losses**

- Total harvest and losses (excluding commercial fisheries discards) in Maryland waters are estimated at 1,026,082 fish and 4,791,219 pounds for 2011. This weight figure reflects reported commercial landings (1,976,473 lbs; Table 2), MRIP weight estimates for recreational harvest (2,640,309 lbs; Table 12), and calculations from the compliance report template for recreational discard mortality (174,437 lbs; Table 6b). Total removals-at-age in numbers of fish and by weight appear in Tables 5 and 6 and in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Catch-at-age Summary).
- There are two values for commercial harvest weight presented in this report: the Maryland Department of Natural Resources (MDDNR) reported landings, and the ASMFC Compliance Report template estimate. The two sources are generally corroborative. The MDDNR landings report is 1,976,473 pounds (Table 2). The ASMFC Compliance Report template estimate is 2,016,303 pounds (Table 6a). The template uses length frequencies and seasonal length-weight parameters derived from fisheries dependent surveys. The two sources are in close agreement for Chesapeake Bay commercial harvest (MDDNR: 1,955,072 pounds; template: 1,985,418 pounds). A larger relative discrepancy appears in the estimation of Atlantic commercial harvest (MDDNR: 21,401 pounds; template: 30,885 pounds), perhaps indicating that the length frequency sample was not representative of the catch.
- There are two estimates of Chesapeake Bay recreational harvest weight presented in this report: the MRIP estimate, and the ASMFC Compliance Report template estimate. The estimates differ by approximately 2%. The 2011 MRIP estimate for Chesapeake Bay is 2,637,719 pounds (Table 15) with a proportional standard error (PSE) of 11%. The

ASMFC Compliance Report template estimate for Maryland's Chesapeake Bay is 2,687,490 pounds (Table 6a). The template uses length frequencies and seasonal length-weight parameters derived from fisheries dependent surveys.

- There are two estimates of Atlantic coast recreational harvest weight presented in this report: the MRIP estimate, and the ASMFC Compliance Report template estimate. The MRIP estimate for the Atlantic coast is 2,590 pounds with a PSE of 105.8%. The ASMFC Compliance Report template estimate for Maryland's Atlantic coast is 2,823 pounds (Table 6a). The template uses length frequencies and seasonal length-weight parameters derived from fisheries dependent surveys.
- It should be noted that estimates of recreational harvest calculated by MRIP and the compliance report template include migratory fish harvested in the spring season which are not counted against Maryland's portion of the Chesapeake Bay recreational quota of 2,657,102 pounds. The 2011 migratory harvest is estimated at 35,182 fish and 593,691 pounds. The estimate of migratory harvest is reported to ASMFC separately (Appendix 1: Estimate of the 2011 Harvest of Spring Coastal Migrant Striped Bass Striped Bass in Chesapeake Bay. Report to the Striped Bass Technical Committee. Horne, J., 2011).
- For a measure of Maryland Chesapeake Bay recreational harvest relative to the quota, the weight estimate of 2011 spring migratory harvest (593,691 pounds) must be subtracted from the total harvest estimates above. The resulting estimates are 2,044,028 pounds (MRIP-based) or 2,093,799 pounds (Compliance report-based). These estimates are under quota by 23% and 21%, respectively.

## B. Fishery Independent Monitoring Programs

### i. Juvenile Striped Bass Seine Survey

- **Description:** The juvenile striped bass seine survey documents annual year-class success for young-of-the-year (YOY) striped bass and relative abundance of many other fish species in Chesapeake Bay. Annual indices of relative abundance provide an early indicator of future adult stock recruitment and document annual variation and long-term trends in abundance and distribution.
- **Survey Design:** Juvenile indices are derived annually from sampling at 22 fixed stations within Maryland's portion of the Chesapeake Bay. Stations have been sampled continuously since 1954, with changes in some station locations. They are divided among four of the major spawning and nursery areas: seven each in the Potomac River and Head of Bay areas and four each in the Nanticoke and Choptank rivers.
- **Time of Year:** Sampling is monthly, with rounds (sampling excursions) occurring during July, August, and September.
- **Gear Type:** Samples are collected using a 30.5-m x 1.24-m bagless beach seine of untreated 6.4-mm bar mesh.
- **Methods:** One end of the seine was held on shore while the other was fully stretched by hand, perpendicular from the beach, and swept with the current. When depths of 1.6-m or greater were encountered, the offshore end was deployed along this depth contour. Striped bass and selected other species were separated into 0 and 1+ age groupings. All other finfish were identified to species and counted. Replicate seine hauls, a minimum of thirty minutes apart, are taken at each site on each sample round. This produces a total of 132 samples from which Bay-wide means are calculated.
- **Results:**
  - **Age 0 Index:** The geometric mean (GM) has been adopted by the ASMFC Striped Bass Technical Committee as the preferred index of YOY striped bass relative abundance to model stock status. The GM is calculated from the  $\log_e(x+1)$  transformation, where x is an individual seine haul catch. A

time series of the juvenile indices with 95% confidence intervals is presented in Figure 1, and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: YOY Index). The 2011 value of 9.57 was more than double the long-term average of 4.29.

- **Age 1 Index:** Age 1 indices were developed from the Maryland Juvenile Striped Bass Seine Survey data. Size ranges were used to determine catch of age 1 fish from records prior to 1991. Since 1991, striped bass have been separated into 0, 1 and 2+ age groups in the recorded data. The GM is calculated from the  $\log_e(x+1)$  transformation, where x is an individual seine haul catch. Age 1 indices with 95% confidence intervals are presented in Figure 2, and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Age 1 Index). The 2011 value of 0.02 was less than the time series average of 0.25.

## ii. Spring Spawning Stock Survey

- **Description:** Since 1985, the spawning stock survey has characterized the status of the spawning stock in Maryland's portion of the Chesapeake Bay, and produces estimates of relative abundance-at-age used in the coast-wide stock assessment.
- **Survey Design:** Sampling is conducted according to a stratified random design. Experimental drift gill nets are used to sample striped bass in the Upper Bay and Potomac River spawning areas. One site within each spawning area (strata) is selected randomly each day.
- **Time of Year:** The survey is conducted annually from late-March through mid-May, six days per week as weather permits.
- **Gear Type:** Panels of experimental drift gill nets were constructed of multifilament nylon twine in the following sizes: 3.00, 3.75, 4.5, 5.25, 6.00, 6.50, 7.00, 8.00, 9.00, and 10.00 inch stretch-mesh. Each panel was 150 feet long and approximately 10 feet deep. Panels were tied together with spaces of approximately 10 feet between each mesh size.
- **Methods:** Experimental drift gill nets were deployed twice each day in a randomly selected survey site at slack tide. The time that each net was deployed was recorded. All fish were removed from the nets as they were pulled into the boat by hand. Striped bass were measured (mm TL), sexed by expression of gonadal products, and tagged with internal anchor tags as time permitted. Scale samples were taken from a sub-sample of male fish, all males over 700 mm TL, and all females for age determination.
- **Results:**
  - **Relative Abundance at age:** Selectivity-corrected CPUEs were developed as fish per 1000 square yards of net per hour. A skew-normal model and bootstrap analysis enabled the development of CIs. The age-length keys used in the model were developed as sex-specific keys. The time series of CPUE estimates is presented in Table 19 and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Spring CPUE @ Age). The length frequency of striped bass sampled in the spring is presented in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Spring LF Time Series). The 2011 composite value of 458 was less than the time series average of 495. All age length keys can be found in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Spring ALKs).
  - **Sex Ratio at Age:** Sex ratio-at-age of fish sampled during the spring survey is presented in Table 20 and the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Spring Sex Ratio).

- **Mean Length at Age:** Length at age was determined by reading a sub-sample of scales taken during the spring surveys in the Upper Bay and Potomac River. Previous statistical analysis showed no difference in mean length-at-age between areas but significant difference ( $\alpha=0.05$ ) between sexes. Therefore, mean length-at-age is presented separately for females and males (Tables 21 and 22).
- **Length Frequency Sample Size:** Spring length frequencies and sample sizes from 1985-2011 are provided in the accompanying Excel file, MD\_SB\_Compliance2011.xls (worksheet: Spring LF Time Series).

### iii. Spring Tagging

- **Description:** During the spring spawning stock survey, striped bass are tagged with USFWS internal anchor tags and released as part of the Cooperative Coastal Striped Bass Tagging Program. The information generated from this effort is used to evaluate stock dynamics of Atlantic Coast striped bass stocks.
- **Results:**
  - In 2011, a total of 1,339 fish were tagged and released during the spring spawning stock survey (655 in the Upper Bay, and 684 on the Potomac River; Figure 3).

## IV. Planned management programs for the current calendar year 2012

### A. Maryland Striped Bass Seasons for 2012.

Striped bass regulations and monitoring programs for 2012 will be similar to 2011.

#### i. Commercial

- **Pound net:** June 1-November 30 (Monday-Saturday); 18-36 inch TL slot limit.
- **Haul seine:** June 7-November 30 (Monday-Friday); 18-36 inch TL slot limit.
- **Hook and line:** June 7-November 29 (Monday-Thursday); 18-36 inch TL slot limit.
- **Drift gill net:** January 1-February 28, December 1-31 (Monday-Friday); 18-36 inch TL slot limit.
- **Atlantic Trawl/Gill net:** January 1-April 30, November 1-December 31 (Monday-Friday); 24 inch TL minimum size

#### ii. Recreational

- **Susquehanna Flats; Catch and Release (March 1-May 3), Catch and Keep (May 16-31, 18-26 inch TL, one fish per person, per day) seasons:** upstream of a line from Sandy Point to Turkey Point and downstream from a line connecting Lapidum boat ramp to Twin Rocks to Tomes Wharf in Port Deposit; and the Northeast River. The Susquehanna River is closed to this fishery. Non-offset circle hooks are required when fishing with baited hooks with a gap larger than 0.5 inches. Eels prohibited.
- **Spring Trophy season (Bay):** April 21-May 15; one fish per person, per day; 28 inch (TL) minimum size limit; fish may be harvested only in the main-stem Bay from Brewerton Channel (Baltimore) to the MD/VA line, All other tributaries, bays, creeks, rivers, and sounds closed except Tangier and Pocomoke sounds. Eels prohibited.
- **Summer-Fall Recreational/Charter Boat season (Bay):** Two fish per person, per day at 18-28 inches (TL) **or** one fish per person, per day, at 18-28 inches (TL) and one fish greater than 28 inches (TL) per person, per day. Eels prohibited before June 1. Boundaries change according to the following schedule: *May 16- May 31*, fish may be harvested only in the main-stem Bay below Hart-Miller Island (Baltimore) to the MD/VA line, and the lowermost five miles of the Chester, Choptank, and Patuxent Rivers. All

other tributaries, bays, creeks, rivers, and sounds closed except Tangier and Pocomoke Sounds. *June 1-December 15*, Bay and all tributaries open.

- **Atlantic Coast Recreational season:** January 1 through December 31, with a two fish per person, per day creel limit and a 28 inch (TL) minimum size limit. EEZ beyond Maryland waters (3 miles offshore) is closed.

## **B. Maryland Striped Bass Quotas for 2012**

- i.** Atlantic Commercial Quota: 126,396 pounds
- ii.** Chesapeake Bay Commercial Quota: 1,963,873 pounds
- iii.** Chesapeake Bay Recreational Quota: 2,657,102 pounds

## **C. Monitoring programs to be performed**

- i.** Conduct spring trophy season creel survey:
  - Survey will estimate CPUE and characterize the legal catch and by-catch of the spring trophy season fishery in terms of age, size, sex, and relative abundance.
- ii.** Conduct Spring Spawning Stock Survey on the Potomac River and Upper Chesapeake Bay spawning grounds:
  - Survey will characterize the spawning stock of representative and important Maryland Chesapeake Bay systems in terms of age, size, sex, and relative abundance.
- iii.** Conduct tagging of striped bass captured on spawning grounds as a participant in the Cooperative Coastal Striped Bass Tagging Program.
- iv.** Sample commercial check stations:
  - Survey will characterize the harvest of the Chesapeake Bay and Atlantic commercial fisheries in terms of age, size, sex, and relative abundance. MD DNR will also monitor the striped bass harvest to ensure compliance with harvest quotas and provide harvest and catch-at-age as required by ASMFC.
- v.** Conduct Juvenile Striped Bass Seine Survey in Maryland's portion of the Chesapeake Bay.
  - Survey will determine the relative abundance of juvenile striped bass in four major spawning areas.
- vi.** Conduct Commercial Pound Net Survey in Maryland's portion of the Chesapeake Bay.
  - Survey will characterize length and age of the pound net catch.
- vii.** Conduct internet-based Striped Bass Volunteer Angler Survey:
  - Survey will characterize length distribution of recreational harvest and discards.

## **D. Changes from the previous year:**

- i.** Commercial Quota Withholding
  - Although the 2012 Chesapeake Bay quota was unchanged from 2011, 5% of the commercial quota was withheld to account for management uncertainty in harvest reporting. The effective commercial Chesapeake Bay 2012 quota was 1,865,680 pounds.

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- Table 4. Summary of 2011 Maryland commercial striped bass fisheries sampling.
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- Table 10. Maryland 2011 striped bass recreational regulations.
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Table 1. Maryland 2011 striped bass commercial regulations.

Season	Bay: pound net (June 1-Nov 30, Mon-Sat)
Annual quota (lbs)	490,968
Trip/Season/Gear Limit	1,600 lbs/day/licensee with multiple allocations; 4 nets/licensee
Minimum Size	18-36 inch TL slot
Reporting requirement	Daily check station reports and monthly harvest report
# of participants	222
Season	Bay: haul seine (June 7-Nov 30, Mon-Fri)
Annual quota (lbs)	Included in pound net quota
Trip/Season/Gear Limit	750 lbs/license/day; 1,250 lbs/license/net/season
Minimum Size	18-36 inch TL slot
Reporting requirement	Daily check station reports and monthly harvest report
# of participants	3
Season	Bay: hook and line (June 7-Nov 30, Mon-Thu)
Annual quota (lbs)	589,162
Trip/Season/Gear Limit	500 lbs/license/day; 1500 lbs/license/week; max 4 people/boat; 2 crew/licensee
Minimum Size	18-36 inch TL slot
Reporting requirement	Daily check station reports and monthly harvest report
# of participants	149
Season	Bay: drift gill net (Jan 1-Feb 28, Dec 1-31, Mon-Fri)
Annual quota (lbs)	883,743
Trip/Season/Gear Limit	300 lbs/licensee/day; max 4 licenses/boat
Minimum Size	18-36 inch TL slot
Reporting requirement	Daily check station reports and monthly harvest report
# of participants	761
Season	Atlantic: drift gill net/otter trawl (Jan 1-Apr 30, Nov 2-Dec 31)
Annual quota (lbs)	126,396
Trip/Season/Gear Limit	1,950 pounds/license/season
Minimum Size	24 inch TL min
Reporting requirement	Daily check station reports and monthly harvest report
# of participants	86



Table 2. Maryland 2011 commercial striped bass harvest by gear type and area, based on MD DNR reported landings.

<b>Area</b>	<b>Gear</b>	<b>Number of Fish*</b>	<b>Pounds</b>
Chesapeake Bay	Pound net	167,034	648,113
	Hook and line	129,475	441,422
	Gill net	192,388	865,537
<b>Bay Total</b>		<b>488,897</b>	<b>1,955,072</b>
Atlantic Ocean	Trawl/gill net	2,072	21,401
<b>MD Total</b>		<b>490,969</b>	<b>1,976,473</b>

\* Number of fish was calculated by dividing pounds reported by monthly mean weights measured during biological surveys.

Table 3. Time series of Maryland Chesapeake Bay commercial striped bass landings in numbers and pounds.

<b>Year</b>	<b>Numbers*</b>	<b>Pounds</b>
<b>1991</b>	31,880	191,066
<b>1992</b>	119,286	552,451
<b>1993</b>	211,089	916,764
<b>1994</b>	208,914	884,970
<b>1995</b>	280,051	856,568
<b>1996</b>	415,272	1,523,293
<b>1997</b>	656,416	2,030,061
<b>1998</b>	780,893	2,368,393
<b>1999</b>	650,022	2,377,393
<b>2000</b>	627,777	2,411,554
<b>2001</b>	538,808	1,774,758
<b>2002</b>	296,635	1,852,634
<b>2003</b>	587,438	1,813,676
<b>2004</b>	461,064	1,899,539
<b>2005</b>	563,859	2,008,687
<b>2006</b>	645,078	2,116,257
<b>2007</b>	586,934	2,240,585
<b>2008</b>	580,651	2,208,018
<b>2009</b>	605,576	2,267,293
<b>2010</b>	595,015	2,104,487
<b>2011</b>	488,897	1,955,072

\* Number of fish was calculated by dividing pounds reported by monthly mean weights measured during biological surveys.

Table 4. Summary of 2011 Maryland commercial striped bass fisheries sampling.

<b>Fishery</b>	<b>Length Frequency Sample Size</b>	<b># Age Samples in Age Length Key</b>
Chesapeake Bay Pound Net /Haul Seine	1,128	149
Chesapeake Bay Hook and Line	1,431	149
Chesapeake Bay Gill net	3,442	126
Atlantic Gill Net/Trawl	208	117

Table 5a. Summary of 2011 Maryland striped bass commercial and recreational removals-at-age (harvest) in numbers of fish.

Fishery:	Catch at age (numbers of fish)						
	0	1	2	3	4	5	6
Comm Atl Gill net, Trawl	0	0	0	0	0	24	90
Comm CB Gill net	0	0	0	11,414	30,177	64,944	53,351
Comm CB Hook and Line	0	0	0	13,367	22,832	37,647	35,799
Comm CB Pound Net	0	0	0	18,002	27,365	41,502	48,042
Rec Wave 2 CB	0	0	0	0	0	0	10
Rec Wave 3 CB	0	0	0	1,428	27,037	24,736	18,248
Rec Waves 4-6 CB	0	0	0	22,046	34,723	87,726	76,328
Rec Atlantic	0	0	0	0	0	0	8
<b>Harvest Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>66,256</b>	<b>142,134</b>	<b>256,578</b>	<b>231,877</b>

Fishery:	Catch at age (numbers of fish)							Total
	7	8	9	10	11	12	13+	
Comm Atl Gill net, Trawl	225	343	333	415	251	62	328	2,072
Comm CB Gill net	21,599	8,762	1,430	492	177	42	0	192,388
Comm CB Hook and Line	16,206	2,028	1,175	226	76	59	60	129,475
Comm CB Pound Net	21,305	5,546	3,507	1,080	228	259	197	167,034
Rec Wave 2 CB	984	7,175	2,972	7,300	3,923	2,582	3,950	28,896
Rec Wave 3 CB	17,433	23,409	5,343	5,743	3,575	1,773	2,278	131,002
Rec Waves 4-6 CB	37,370	9,324	8,846	2,795	1,405	1,258	3,197	285,018
Rec Atlantic	53	70	58	45	9	4	9	255
<b>Harvest Total</b>	<b>115,175</b>	<b>56,658</b>	<b>23,664</b>	<b>18,095</b>	<b>9,644</b>	<b>6,040</b>	<b>10,020</b>	<b>936,140</b>

Table 5b. Summary of 2011 Maryland striped bass commercial and recreational removals-at-age (discard mortality) in numbers of fish.

Fishery:	Catch at age (numbers of fish)						
	0	1	2	3	4	5	6
Rec Discard Mort Wave 2 CB	0	0	6	45	135	70	78
Rec Discard Mort Wave 3 CB	0	217	848	4,972	6,037	981	772
Rec Discard Mort Waves 4-6 CB	0	21,445	15,272	19,688	4,700	4,131	3,134
Rec Discard Mort Atlantic	0	0	1	1	5	10	18
<b>Rec Discard Mort Total</b>	<b>0</b>	<b>21,661</b>	<b>16,127</b>	<b>24,706</b>	<b>10,877</b>	<b>5,192</b>	<b>4,002</b>
<b>GRAND TOTAL (Removals)</b>	<b>0</b>	<b>21,661</b>	<b>16,127</b>	<b>90,962</b>	<b>153,011</b>	<b>261,769</b>	<b>235,879</b>

Fishery:	Catch at age (numbers of fish)							Total
	7	8	9	10	11	12	13+	
Rec Discard Mort Wave 2 CB	106	375	146	298	139	75	99	1,574
Rec Discard Mort Wave 3 CB	527	944	264	311	135	63	50	16,121
Rec Discard Mort Waves 4-6 CB	3,039	475	190	95	0	0	0	72,168
Rec Discard Mort Atlantic	19	17	5	3	1	0	1	81
<b>Rec Discard Mort Total</b>	<b>3,691</b>	<b>1,811</b>	<b>605</b>	<b>707</b>	<b>275</b>	<b>139</b>	<b>150</b>	<b>89,943</b>
<b>GRAND TOTAL (Removals)</b>	<b>118,867</b>	<b>58,469</b>	<b>24,268</b>	<b>18,802</b>	<b>9,919</b>	<b>6,179</b>	<b>10,169</b>	<b>1,026,083</b>

Table 6a. Summary of 2011 Maryland striped bass commercial and recreational removals-at-age (harvest) in pounds of fish\*.

<b>Fishery:</b>	<b>Total Weight at age (lb)</b>						
	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Comm Atl Gill net, Trawl	0	0	0	0	0	158	647
Comm CB Gill net	0	0	0	38,809	103,580	277,088	236,401
Comm CB Hook and Line	0	0	0	31,793	64,603	122,637	140,103
Comm CB Pound Net	0	0	0	44,881	75,037	137,478	211,790
Rec Wave 2 CB	0	0	0	0	0	0	82
Rec Wave 3 CB	0	0	0	3,954	85,300	91,201	87,264
Rec Waves 4-6 CB	0	0	0	56,213	97,373	289,727	324,741
Rec Atlantic	0	0	0	0	0	0	66
<b>Harvest Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>175,650</b>	<b>425,894</b>	<b>918,290</b>	<b>1,001,094</b>

<b>Fishery:</b>	<b>Total Weight at age (lb)</b>							<b>Total</b>
	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13+</b>	
Comm Atl Gill net, Trawl	2,037	3,723	4,480	6,599	4,516	1,156	7,569	30,885
Comm CB Gill net	120,582	51,517	13,302	7,434	2,609	558	0	851,881
Comm CB Hook and Line	67,480	14,682	10,793	2,403	724	715	933	456,866
Comm CB Pound Net	104,490	43,585	36,279	14,309	2,200	3,355	3,266	676,670
Rec Wave 2 CB	10,697	91,259	42,674	122,907	71,505	51,943	93,336	484,402
Rec Wave 3 CB	114,519	208,625	55,833	88,151	60,277	36,870	50,657	882,652
Rec Waves 4-6 CB	195,195	72,766	92,694	41,371	26,235	31,032	93,088	1,320,437
Rec Atlantic	477	725	638	587	131	62	137	2,823
<b>Harvest Total</b>	<b>615,477</b>	<b>486,881</b>	<b>256,694</b>	<b>283,760</b>	<b>168,197</b>	<b>125,692</b>	<b>248,986</b>	<b>4,706,616</b>

\* Pounds presented here are calculated by the Compliance Report template supplied by ASMFC using length-weight regression parameters. They differ slightly from commercial pounds reported by MDDNR and weight estimates produced by MRIP.

Table 6b. Summary of 2011 Maryland striped bass commercial and recreational removals-at-age (discard mortality) in pounds of fish\*.

Fishery:	Total Weight at age (lb)						
	0	1	2	3	4	5	6
Rec Discard Mort Wave 2 CB	0	0	7	72	342	269	386
Rec Discard Mort Wave 3 CB	0	86	837	6,927	12,082	3,470	3,618
Rec Discard Mort Waves 4-6 CB	0	7,377	9,675	29,299	11,078	11,904	11,114
Rec Discard Mort Atlantic	0	0	1	2	16	53	110
<b>Rec Discard Mort Total</b>	<b>0</b>	<b>7,463</b>	<b>10,519</b>	<b>36,300</b>	<b>23,518</b>	<b>15,696</b>	<b>15,228</b>
<b>GRAND TOTAL (Removals)</b>	<b>0</b>	<b>7,463</b>	<b>10,519</b>	<b>211,951</b>	<b>449,412</b>	<b>933,986</b>	<b>1,016,322</b>

Fishery:	Total Weight at age (lb)							Total
	7	8	9	10	11	12	13+	
Rec Discard Mort Wave 2 CB	858	4,366	1,972	4,893	2,387	1,420	2,378	19,351
Rec Discard Mort Wave 3 CB	3,493	8,969	2,987	4,754	2,145	1,177	994	51,539
Rec Discard Mort Waves 4-6 CB	16,977	3,179	1,585	792	0	0	0	102,979
Rec Discard Mort Atlantic	137	134	51	36	9	5	15	568
<b>Rec Discard Mort Total</b>	<b>21,465</b>	<b>16,648</b>	<b>6,595</b>	<b>10,476</b>	<b>4,541</b>	<b>2,602</b>	<b>3,387</b>	<b>174,437</b>
<b>GRAND TOTAL (Removals)</b>	<b>636,942</b>	<b>503,529</b>	<b>263,289</b>	<b>294,236</b>	<b>172,738</b>	<b>128,294</b>	<b>252,373</b>	<b>4,881,054</b>

\* Pounds presented here are calculated by the Compliance Report template supplied by ASMFC using length-weight regression parameters. They differ slightly from commercial pounds reported by MDDNR and weight estimates produced by MRIP.

Table 7. Mean length-at-age of striped bass samples aged from commercial pound net and hook and line fisheries in Maryland Chesapeake Bay, June through November 2010\*.

<b>Year Class</b>	<b>Age</b>	<b>n</b>	<b>Mean Length (mm TL)</b>	<b>Standard Deviation</b>	<b>Lower CI (95%)</b>	<b>Upper CI (95%)</b>
2007	3	8	475	18	460	490
2006	4	9	498	37	470	527
2005	5	9	570	55	528	612
2004	6	21	648	76	614	683
2003	7	24	709	83	674	744
2002	8	12	794	59	756	831
2001	9	21	791	56	766	816
2000	10	8	811	54	766	856
1999	11	1	830	-	-	-
1998	12	1	847	-	-	-
1997	13	1	887	-	-	-
1996	14	1	884	-	-	-

\* 2011 ALK not complete at time of this writing.

Table 8. Mean length-at-age of striped bass samples aged from commercial drift gill net fisheries in Maryland Chesapeake Bay, December 2010 through February 2011.

<b>Year Class</b>	<b>Age*</b>	<b>n</b>	<b>Mean Length (mm TL)</b>	<b>Standard Deviation</b>	<b>Lower CI (95%)</b>	<b>Upper CI (95%)</b>
2007	4	16	478	22	465	489
2006	5	15	545	49	518	573
2005	6	14	598	64	561	635
2004	7	20	662	67	631	694
2003	8	24	732	65	705	760
2002	9	17	762	57	733	792
2001	10	15	811	85	764	858
2000	11	3	878	13	846	910
1999	12	2	823	13	809	837

\* Age was calculated by subtracting year-class from the year in which the fishery ended, i.e. 2011.



Table 9. Summary of 2011 mean weight-at-age in kilograms for Maryland striped bass Atlantic and Chesapeake Bay commercial fisheries as calculated by the ASMFC compliance report template.

<b>Fishery:</b>	<b>Mean weight at age (kg)</b>					
	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Comm Atl Gillnet, Trawl	-	-	2.98	3.26	4.10	4.92
Comm CB Gillnet	1.54	1.56	1.94	2.01	2.53	2.67
Comm CB Hook and Line	1.08	1.28	1.48	1.78	1.89	3.28
Comm CB Pound Net	1.13	1.24	1.50	2.00	2.22	3.56

<b>Fishery:</b>	<b>Mean weight at age (kg)</b>				
	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13+</b>
Comm Atl Gillnet, Trawl	6.10	7.21	8.16	8.47	10.46
Comm CB Gillnet	4.22	6.86	6.69	6.04	-
Comm CB Hook and Line	4.17	4.83	4.31	5.51	7.02
Comm CB Pound Net	4.69	6.01	4.37	5.87	7.50

Table 10. Maryland 2011 striped bass recreational regulations.

Season	Susquehanna Flats Catch and Release (Mar 1-May 3)
Bag Limit	N/A
Minimum Size	N/A
Special Conditions	No eels; circle hooks required if baited hook has gap greater than 0.5 inches
License	Yes
Season	Susquehanna Flats Catch and Keep (Mar 16-May 31)
Bag Limit	1 fish/person/day
Minimum Size	18-26 inches TL
Special Conditions	No eels; circle hooks required if baited hook has gap greater than 0.5 inches
License	Yes
Season	Bay: Spring Trophy (April 16-May 15)
Bag Limit	1 fish/person/day
Minimum Size	28 inches TL
Special Conditions	Main-stem Bay from Baltimore to MD/VA line, tribs closed
License	Yes
Season	Bay: Spring/Early Summer (May 16-31)
Bag/Size Limit	2 fish/person/day @ 18-28 inches TL <b>OR</b> 1 fish/person/day @ 18-28 inches and 1 fish/person/day @ 28+ inches TL
Special Conditions	main-stem Bay from Baltimore to MD/VA line, tribs closed except the lower 5 mile (approx) of the Chester, Choptank, and Patuxent rivers
License	Yes
Season	Bay: Summer/Fall Rec/Charter (June 1-Dec 15)
Bag/Size Limit	2 fish/person/day @ 18-28 inches TL <b>OR</b> 1 fish/person/day @ 18-28 inches and 1 fish/person/day @ 28+ inches TL
Special Conditions	Bay and tribs open
License	Yes
Season	Atlantic Coast (Jan 1-Dec 31)
Bag Limit	2 fish/person/day
Minimum Size	28 inches TL
Special Conditions	Closed beyond MD waters, 3 miles from shore (EEZ)
License	Yes

Table 11. MRIP/MRFSS comparison, 2004-2011. Maryland striped bass harvest (Type A+B1) in numbers of fish, all modes, areas combined (personal communication, NMFS; June 12, 2012).

<b>Year</b>	<b>MRFSS (numbers of fish)</b>	<b>MRIP (numbers of fish)</b>	<b>Difference: MRIP-MRFSS</b>	<b>% Change from MRFSS</b>	<b>PSE for MRIP</b>
2004	380,461	368,682	-11,780	-3.10%	12.5
2005	490,275	533,930	43,655	8.90%	13.2
2006	648,644	669,140	20,496	3.16%	12.2
2007	679,024	765,169	86,146	12.70%	14.8
2008	442,280	415,403	-26,877	-6.08%	12.6
2009	530,395	501,845	-28,551	-5.38%	11.9
2010	469,161	457,898	-11,263	-2.40%	14.4
2011	486,157	445,170	-40,987	-8.43%	10.8

Table 12. MRIP/MRFSS comparison, 2004-2011. Maryland striped bass harvest (Type A+B1) in pounds, all modes, areas combined (personal communication, NMFS; June 12, 2012).

<b>Year</b>	<b>MRFSS (pounds of fish)</b>	<b>MRIP (pounds of fish)</b>	<b>Difference: MRIP-MRFSS</b>	<b>% Change from MRFSS</b>	<b>PSE for MRIP</b>
2004	2,333,042	2,347,752	14,710	0.63%	14.1
2005	3,533,653	4,612,417	1,078,764	30.50%	19.2
2006	3,541,581	3,868,944	327,363	9.24%	12.4
2007	3,178,237	3,504,041	325,803	10.25%	12.7
2008	2,637,998	2,728,048	90,050	3.41%	12.3
2009	4,558,773	4,278,145	-280,628	-6.16%	14.8
2010	2,552,257	2,630,802	78,545	3.08%	15.2
2011	2,819,369	2,640,309	-179,060	-6.35%	11.0

Table 13. MRIP/MRFSS comparison, 2004-2011. Maryland striped bass live discards (Type B2) in numbers of fish, all modes, areas combined (personal communication, NMFS; June 12, 2012).

<b>Year</b>	<b>MRFSS (numbers of fish)</b>	<b>MRIP (numbers of fish)</b>	<b>Difference: MRIP-MRFSS</b>	<b>% Change from MRFSS</b>	<b>PSE for MRIP</b>
2004	3,738,523	3,479,634	-258,889	-6.92%	14.1
2005	3,753,328	3,855,552	102,224	2.72%	18.3
2006	3,895,798	3,711,343	-184,456	-4.73%	13.8
2007	2,998,085	3,064,928	66,842	2.23%	22.9
2008	1,405,613	1,338,728	-66,885	-4.76%	18.5
2009	1,218,342	1,423,332	204,990	16.80%	17.8
2010	1,445,550	1,508,647	63,097	4.36%	22.3
2011	977,264	1,127,511	150,246	15.40%	18.4

Table 14. Maryland 2011 striped bass recreational harvest (Type A+B1) by area and MRIP wave in numbers of fish.

<b>Wave</b>	<b>Chesapeake Bay</b>	<b>Atlantic Coast</b>	<b>Total</b>
1 (Jan-Feb)	0	0	0
2 (Mar-Apr)	28,896	0	28,896
3 (May-June)	131,002	0	131,002
4 (July-Aug)	109,303	0	109,303
5 (Sept-Oct)	119,281	0	119,281
6 (Nov-Dec)	56,434	255	56,689
<b>Total</b>	<b>444,915</b>	<b>255</b>	<b>445,170</b>

\*Note: values may not sum due to rounding

Table 15. Time series of Maryland Chesapeake Bay recreational striped bass landings, in numbers and pounds (MRFSS 1982-2003; MRIP 2004-present; Type A+B1, inland waters).

<b>Year</b>	<b>Numbers</b>	<b>Pounds</b>
<b>1982</b>	984	
<b>1983</b>	31,746	149,351
<b>1984</b>	16,789	44,262
<b>1985</b>	2,965	8,825
<b>1986</b>	14,077	3,104
<b>1987</b>	4,025	40,818
<b>1988</b>	133	1,058
<b>1989</b>		
<b>1990</b>	736	12,967
<b>1991</b>	77,873	456,954
<b>1992</b>	99,354	613,174
<b>1993</b>	104,682	794,853
<b>1994</b>	199,378	1,096,409
<b>1995</b>	355,237	2,057,450
<b>1996</b>	337,415	1,560,389
<b>1997</b>	334,068	1,962,947
<b>1998</b>	391,824	1,908,344
<b>1999</b>	263,191	1,137,940
<b>2000</b>	506,462	2,100,854
<b>2001</b>	382,557	2,072,943
<b>2002</b>	282,429	1,423,515
<b>2003</b>	530,488	2,975,437
<b>2004</b>	363,983	2,313,359
<b>2005</b>	531,412	4,578,687
<b>2006</b>	668,798	3,866,227
<b>2007</b>	765,169	3,504,041
<b>2008</b>	415,403	2,728,048
<b>2009</b>	498,614	4,234,461
<b>2010</b>	452,439	2,583,008
<b>2011</b>	444,915	2,637,719

Table 16. Catch-at-age (in numbers of fish) for the 2011 Maryland striped bass recreational harvest by MRIP wave in Chesapeake Bay (CB) and on Atlantic Coast.

Catch at Age (numbers of fish)						
Age	Wave 2 CB	Wave 3 CB	Waves 4-6 CB	CB Total	Atlantic	MD Total
0	0	0	0	<b>0</b>	0	<b>0</b>
1	0	0	0	<b>0</b>	0	<b>0</b>
2	0	0	0	<b>0</b>	0	<b>0</b>
3	0	1,428	22,046	<b>23,474</b>	0	<b>23,474</b>
4	0	27,037	34,723	<b>61,759</b>	0	<b>61,759</b>
5	0	24,736	87,726	<b>112,462</b>	0	<b>112,462</b>
6	10	18,248	76,328	<b>94,586</b>	8	<b>94,594</b>
7	984	17,433	37,370	<b>55,787</b>	53	<b>55,840</b>
8	7,175	23,409	9,324	<b>39,908</b>	70	<b>39,978</b>
9	2,972	5,343	8,846	<b>17,161</b>	58	<b>17,218</b>
10	7,300	5,743	2,795	<b>15,838</b>	45	<b>15,883</b>
11	3,923	3,575	1,405	<b>8,902</b>	9	<b>8,911</b>
12	2,582	1,773	1,258	<b>5,614</b>	4	<b>5,618</b>
13	1,612	604	1,012	<b>3,227</b>	7	<b>3,235</b>
14	864	467	494	<b>1,825</b>	0	<b>1,825</b>
15	870	425	735	<b>2,030</b>	0	<b>2,030</b>
16	604	783	956	<b>2,343</b>	0	<b>2,343</b>
<b>Total</b>	<b>28,896</b>	<b>131,002</b>	<b>285,018</b>	<b>444,915</b>	<b>255</b>	<b>445,170</b>

\*Note: values may not sum due to rounding

Table 17. Time series of Maryland recreational discards of striped bass in numbers of fish (MRFSS 1982-2003, MRIP 2004-present).

<b>Year</b>	<b>Numbers of Fish</b>
<b>1982</b>	30,376
<b>1983</b>	213,487
<b>1984</b>	104,095
<b>1985</b>	147,103
<b>1986</b>	390,063
<b>1987</b>	118,395
<b>1988</b>	132,250
<b>1989</b>	114,269
<b>1990</b>	420,084
<b>1991</b>	1,036,011
<b>1992</b>	749,959
<b>1993</b>	1,556,848
<b>1994</b>	2,785,392
<b>1995</b>	2,401,277
<b>1996</b>	2,545,238
<b>1997</b>	4,019,987
<b>1998</b>	2,641,680
<b>1999</b>	2,387,615
<b>2000</b>	3,244,731
<b>2001</b>	2,890,054
<b>2002</b>	2,928,589
<b>2003</b>	4,580,161
<b>2004</b>	3,479,614
<b>2005</b>	3,855,552
<b>2006</b>	3,711,342
<b>2007</b>	3,064,171
<b>2008</b>	1,338,728
<b>2009</b>	1,418,683
<b>2010</b>	1,508,647
<b>2011</b>	1,124,289

Table 18. Maryland 2011 recreational striped bass discard mortality at age by MRIP wave in Chesapeake Bay (CB) and the Atlantic Ocean (Atl).

Discard Mortality at age (numbers of fish)					
Age	Wave 2 CB	Wave 3 CB	Waves 4-6 CB	Waves 5, 6 Atl	Total
0	0	0	0	0	0
1	0	217	21,445	0	21,662
2	6	848	15,272	1	16,127
3	45	4,972	19,688	1	24,706
4	135	6,037	4,700	5	10,877
5	70	981	4,131	10	5,192
6	78	772	3,134	18	4,002
7	106	527	3,039	19	3,691
8	375	944	475	17	1,811
9	146	264	190	5	605
10	298	311	95	3	707
11	139	135	0	1	275
12	75	63	0	0	138
13	35	20	0	1	56
14	30	15	0	0	45
15	20	13	0	0	30
16	14	2	0	0	19
<b>TOTAL</b>	<b>1,574</b>	<b>16,121</b>	<b>72,168</b>	<b>81</b>	<b>89,943</b>

\*Note: values may not sum due to rounding



Table 19. Time series of relative abundance at age, corrected for selectivity, from Chesapeake Bay striped bass spring spawning stock survey. Includes Potomac, Upper Bay and Choptank River (1985-1994, 1996), sexes combined. Units are number of fish per 1000 square yards of gill net per hour.

YEAR	AGE															TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	
1985	0	140.5	305.5	31.9	4.8	1.3	2.2	0.0	0.4	0.1	0.0	0.4	0.3	0.0	0.7	<b>488</b>
1986	0	230.2	261.1	497.6	4.0	5.3	2.0	2.9	2.8	0.0	0.0	0.0	0.0	0.0	0.9	<b>1007</b>
1987	0	142.2	258.0	115.1	176.1	17.9	2.2	2.6	0.2	0.0	0.0	0.0	0.0	0.3	0.3	<b>715</b>
1988	0	40.8	77.6	71.3	57.0	74.6	1.3	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.3	<b>327</b>
1989	0	33.1	154.7	80.5	45.5	48.8	32.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	<b>396</b>
1990	0	78.1	158.1	120.4	48.3	34.3	32.0	29.8	0.9	0.1	0.1	0.5	0.7	0.1	0.2	<b>504</b>
1991	0	73.4	191.1	62.2	47.1	26.7	26.1	19.2	10.7	0.4	1.5	0.0	0.6	0.6	1.1	<b>461</b>
1992	0.1	27.4	221.1	153.5	58.6	69.9	42.9	29.1	13.7	7.0	3.3	0.0	1.0	1.2	0.2	<b>629</b>
1993	0	41.0	132.0	187.2	88.2	51.0	51.9	37.1	22.6	7.4	3.1	0.8	1.4	1.4	0.1	<b>625</b>
1994	0	26.8	103.5	98.0	117.9	59.5	34.0	42.9	17.6	8.6	3.1	1.3	0.3	0.0	0.0	<b>514</b>
1995	0	50.0	117.2	67.3	60.9	51.8	40.2	25.1	19.8	11.6	9.7	3.5	4.7	0.0	0.0	<b>462</b>
1996	0	4.0	368.3	102.2	34.7	69.5	64.4	42.3	35.4	16.7	15.2	4.7	1.6	0.0	0.0	<b>759</b>
1997	0	36.8	44.8	140.3	46.5	20.9	18.9	22.1	26.6	11.4	9.9	3.3	1.2	0.6	0.0	<b>387</b>
1998	0	36.1	142.8	32.7	149.3	32.3	13.2	18.5	17.3	15.0	9.1	9.9	1.7	0.4	0.3	<b>479</b>
1999	0	8.6	172.4	78.9	58.6	36.7	11.7	7.0	11.5	5.2	4.8	2.8	1.1	2.1	0.1	<b>397</b>
2000	0	14.4	55.9	104.1	48.0	57.7	25.0	13.8	8.3	7.9	7.0	7.4	1.5	2.5	0.5	<b>352</b>
2001	0	4.9	39.1	60.3	53.2	23.1	29.1	33.3	11.6	12.1	9.3	6.1	3.5	1.2	0.4	<b>283</b>
2002	0	84.6	40.8	39.7	85.8	42.7	35.0	33.1	23.5	8.4	5.8	3.6	5.2	1.2	0.4	<b>400</b>
2003	0	15.7	111.5	53.4	35.4	68.4	51.6	27.6	26.7	29.1	14.7	7.5	6.1	2.5	0.3	<b>455</b>
2004	0	28.8	193.2	121.2	42.4	34.6	44.4	47.3	30.1	23.1	23.1	6.7	4.2	3.7	2.6	<b>611</b>
2005	0	66.0	103.6	73.5	96.6	24.3	25.9	21.7	27.5	20.4	17.5	11.3	3.0	1.0	3.8	<b>500</b>
2006	0	7.5	257.9	40.1	47.6	29.2	14.8	12.7	18.4	21.6	13.1	11.0	9.3	2.7	6.1	<b>506</b>
2007	0	7.9	22.5	76.0	14.9	15.3	13.5	7.4	9.0	10.0	16.0	8.0	3.0	5.4	5.3	<b>216</b>
2008	0	3.3	86.0	108.4	112.3	16.9	23.0	19.7	11.3	12.0	10.1	14.0	13.4	3.3	3.6	<b>445</b>
2009	0	40.1	42.1	153.0	51.6	138.2	21.1	22.7	31.2	9.0	15.8	12.1	23.4	4.8	4.8	<b>574</b>
2010	0	7.5	149.7	50.4	65	50.5	54.9	6.7	13.9	10.2	4.0	5.1	5.9	9.9	19.4	<b>453</b>
2011	0	23	73.3	123.7	45.4	57.3	38	44.9	10.1	9.1	7.9	7.8	4	4.3	9.5	<b>458</b>
<b>AVERAGE</b>	<b>0.0</b>	<b>47.1</b>	<b>143.9</b>	<b>105.3</b>	<b>62.8</b>	<b>42.9</b>	<b>27.8</b>	<b>21.1</b>	<b>14.9</b>	<b>9.7</b>	<b>7.6</b>	<b>4.7</b>	<b>3.6</b>	<b>1.8</b>	<b>2.3</b>	<b>495</b>

Table 20. Sex ratio-at-age of fish sampled on the Potomac River and Upper Bay, late March-May 2011.

<b>Age</b>	<b>% Male</b>	<b>% Female</b>
1	0	0
2	100	0
3	100	0
4	98	2
5	97	3
6	99	1
7	98	2
8	91	9
9	91	9
10	74	26
11	85	15
12	86	14
13	64	36
14	80	20
15+	74	26
<b>TOTAL</b>	<b>96</b>	<b>4</b>

Table 21. Mean length-at-age (mm TL) for female striped bass collected in the Potomac River (P) and Upper Bay (UB), late March-May 2011.

<b>YEAR-CLASS</b>	<b>AGE</b>	<b>AREA</b>	<b>N</b>	<b>MEAN</b>	<b>LOW CI</b>	<b>HIGH CI</b>	<b>SD</b>	<b>SE</b>
<b>2007</b>	4	POTOMAC	1	519	-	-	-	-
		UPPER	2	550	-118	1217	74	53
		COMBINED	3	539	402	677	55	32
<b>2006</b>	5	POTOMAC	0	-	-	-	-	-
		UPPER	1	568	-	-	-	-
		COMBINED	1	568	-	-	-	-
<b>2005</b>	6	POTOMAC	0	-	-	-	-	-
		UPPER	4	600	519	682	51	26
		COMBINED	4	600	519	682	51	26
<b>2004</b>	7	POTOMAC	0	-	-	-	-	-
		UPPER	1	685	-	-	-	-
		COMBINED	1	685	-	-	-	-
<b>2003</b>	8	POTOMAC	4	869	728	1011	89	44
		UPPER	10	791	761	821	42	13
		COMBINED	14	813	775	852	66	18
<b>2002</b>	9	POTOMAC	2	891	815	967	8	6
		UPPER	3	830	531	1130	121	70
		COMBINED	5	855	741	968	92	41
<b>2001</b>	10	POTOMAC	6	932	896	967	34	14
		UPPER	7	915	858	973	62	23
		COMBINED	13	923	893	953	50	14
<b>2000</b>	11	POTOMAC	1	958	-	-	-	-
		UPPER	5	921	781	1061	113	50
		COMBINED	6	927	820	1034	102	42
<b>1999</b>	12	POTOMAC	2	1051	638	1463	46	33
		UPPER	7	965	934	996	33	13
		COMBINED	9	984	945	1022	50	17
<b>1998</b>	13	POTOMAC	8	1017	970	1064	56	20
		UPPER	5	1050	988	1112	50	22
		COMBINED	13	1029	997	1062	54	15
<b>1997</b>	14	POTOMAC	3	1125	1093	1157	13	8
		UPPER	1	971	-	-	-	-
		COMBINED	4	1087	963	1210	78	39
<b>1996</b>	15	POTOMAC	1	1209	-	-	-	-
		UPPER	2	1059	468	1649	66	47
		COMBINED	3	1109	864	1353	99	57
<b>1995</b>	16	POTOMAC	2	1127	498	1755	70	50
		UPPER	2	1131	1116	1205	5	4
		COMBINED	4	1144	1072	1215	45	23

Table 22. Mean length-at-age (mm TL) for male striped bass collected in the Potomac River (P) and Upper Bay (UB), late March-May 2011.

<b>YEAR-CLASS</b>	<b>AGE</b>	<b>AREA</b>	<b>N</b>	<b>MEAN</b>	<b>LCL</b>	<b>UCL</b>	<b>SD</b>	<b>SE</b>
<b>2009</b>	2	POTOMAC	5	345	295	395	40	18
		UPPER	5	311	277	344	27	12
		COMBINED	10	328	301	354	37	12
<b>2008</b>	3	POTOMAC	11	359	334	384	37	11
		UPPER	15	376	349	403	49	13
		COMBINED	26	369	351	387	44	9
<b>2007</b>	4	POTOMAC	17	457	426	488	60	15
		UPPER	13	444	411	478	56	15
		COMBINED	30	451	430	473	58	11
<b>2006</b>	5	POTOMAC	11	555	524	586	46	14
		UPPER	6	561	501	620	56	23
		COMBINED	17	557	532	582	48	12
<b>2005</b>	6	POTOMAC	17	614	592	637	43	10
		UPPER	13	567	536	599	52	14
		COMBINED	30	594	575	613	52	9
<b>2004</b>	7	POTOMAC	18	696	660	732	73	17
		UPPER	17	683	642	724	80	19
		COMBINED	35	689	664	715	76	13
<b>2003</b>	8	POTOMAC	15	756	720	793	66	17
		UPPER	47	743	719	768	84	12
		COMBINED	62	747	726	767	80	10
<b>2002</b>	9	POTOMAC	11	790	746	834	66	20
		UPPER	9	801	735	867	86	29
		COMBINED	20	795	760	829	74	16
<b>2001</b>	10	POTOMAC	4	757	696	817	38	19
		UPPER	6	868	810	925	55	22
		COMBINED	10	823	770	876	74	23
<b>2000</b>	11	POTOMAC	7	877	790	964	94	36
		UPPER	11	899	862	936	55	17
		COMBINED	18	891	855	926	71	17
<b>1999</b>	12	POTOMAC	4	946	866	1027	51	25
		UPPER	5	932	851	1013	65	29
		COMBINED	9	939	895	982	56	19
<b>1998</b>	13	POTOMAC	2	887	455	1319	48	34
		UPPER	1	995	-	-	-	-
		COMBINED	3	923	747	1099	71	41
<b>1997</b>	14	POTOMAC	2	946	501	1391	49	35
		UPPER	3	993	922	1065	29	17
		COMBINED	5	974	923	1026	41	18
<b>1996</b>	15	POTOMAC	0	-	-	-	-	-
		UPPER	1	1106	-	-	-	-
		COMBINED	1	1106	-	-	-	-

Figure 1. Maryland juvenile striped bass survey geometric mean (GM) catch per haul of YOY striped bass with 95% confidence intervals ( $\pm 2$  SE) and Target Period Average (TPA).

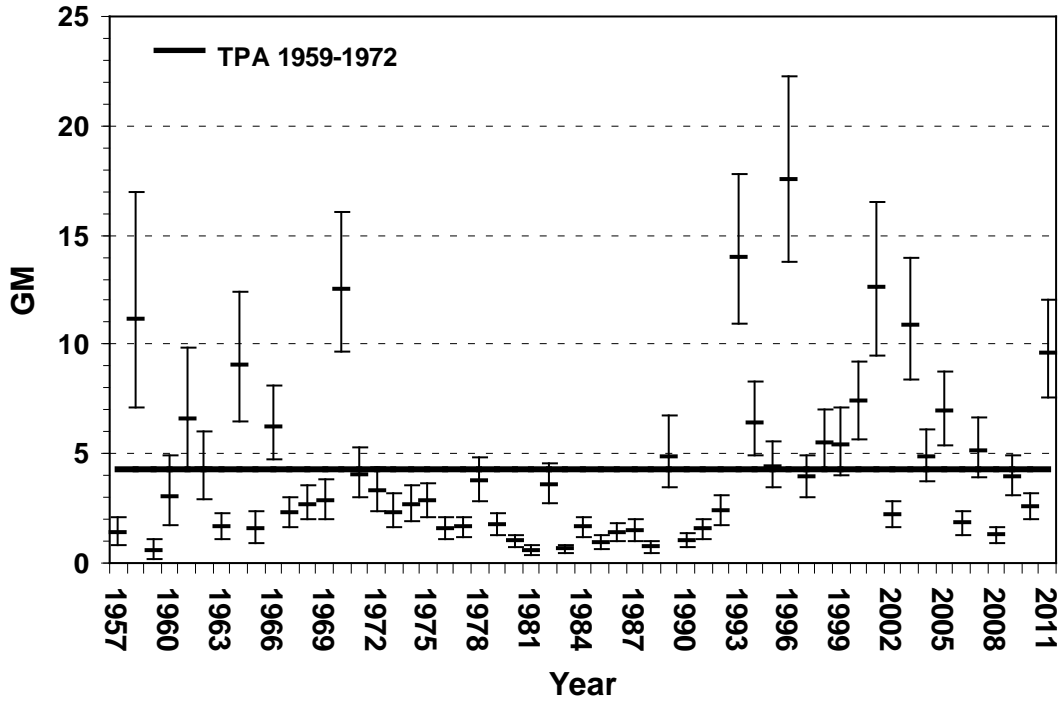


Figure 2. Maryland juvenile striped bass survey geometric mean (GM) catch per haul of age-1 striped bass with 95% confidence intervals ( $\pm 2$  SE).

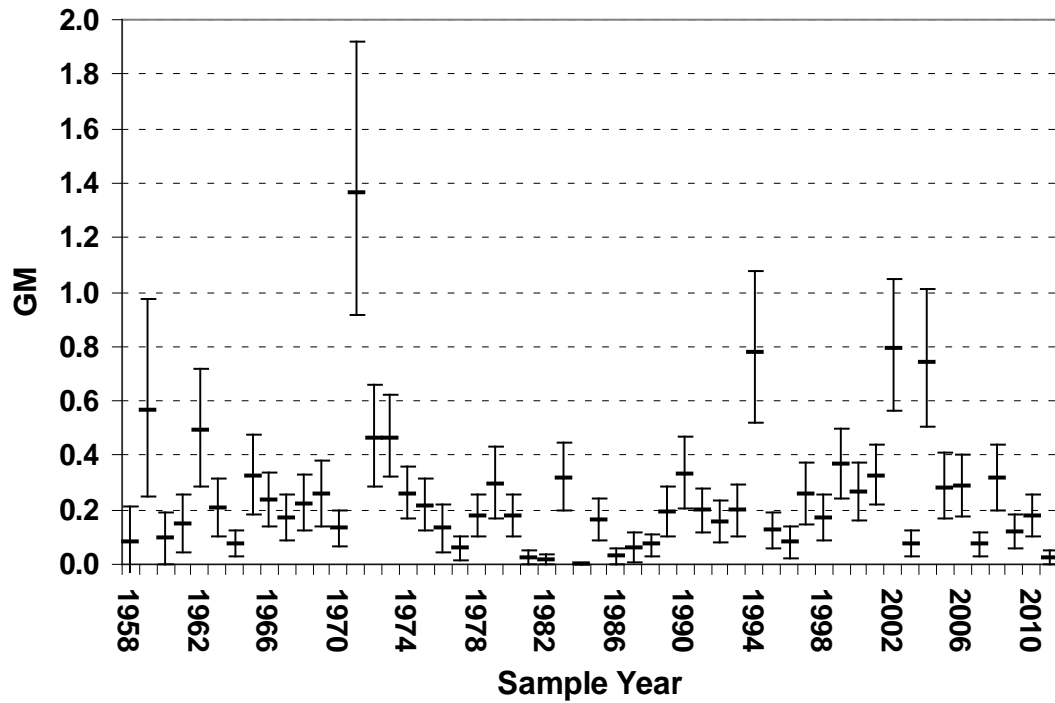
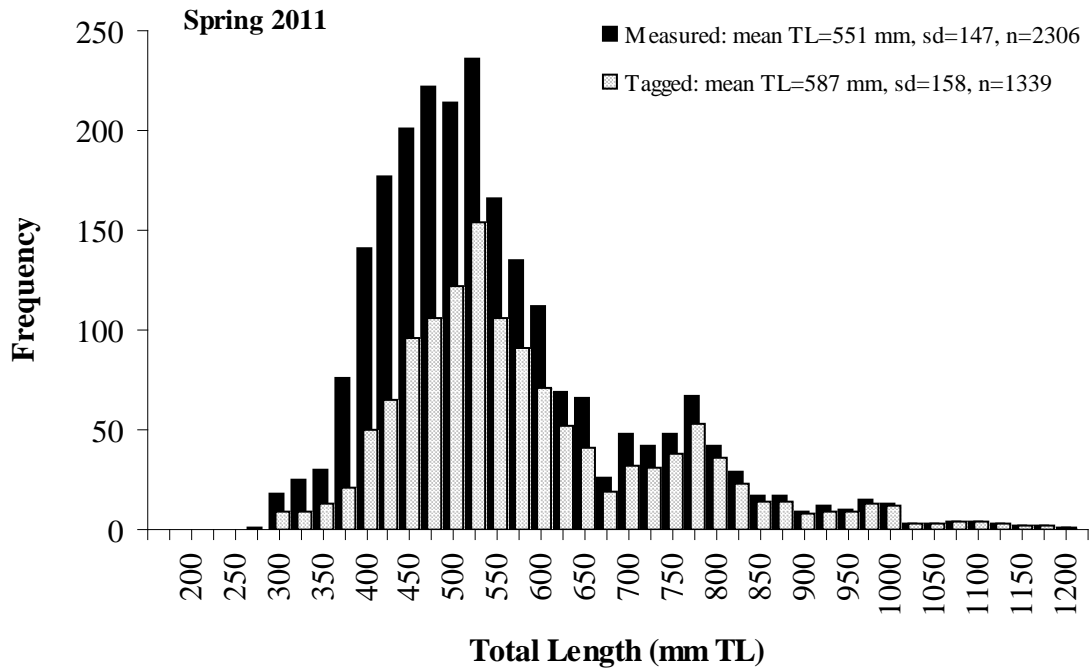


Figure 3. Length frequency of striped bass measured and tagged during the spawning stock survey in the Upper Bay and Potomac River, April-May 2011.



Appendix 1.

Estimate of the 2011 Harvest  
of Spring Coastal Migrant Striped Bass in Chesapeake Bay

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November 29, 2011

This report presents the calculation of the 2011 Maryland spring harvest of coastal migrant striped bass in Chesapeake Bay. The method used to estimate the spring trophy season harvest in Maryland was presented in detail in Jones (2003), Barker and Sharov (2004), and Sharov et al. (2005). Results of the 2011 calculations are summarized in Table 1. The specific steps used in the calculation are as follows:

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*Estimation of harvest.*

- Maryland charter boat logbook reports provided the census values of daily charter boat harvest in number of fish (Table 1).
- NOAA MRFSS survey provided estimates of harvest for Maryland private/rental boats for Waves 2 and 3 (Table 1).
- VMRC provided the preliminary estimate of Virginia migratory striped bass harvest.

*Harvest apportioned by time.*

- The migrant harvest season overlaps parts of both Wave 2 and 3 of the MRFSS survey. Length distribution of the harvest is known to change over this time period, so total harvest was apportioned into 2-week intervals between April 16 and June 15.
- All Wave 2 landings occurred in the last 2 weeks of the wave.
- 2-week interval proportions for Wave 3 landings were developed as the proportions of the harvest registered in the Maryland charter boat logbook reports (Table 1).
- Total Maryland striped bass harvest per interval was calculated as charter boat harvest + private/rental harvest (Table 1).

*Harvest apportioned by length.*

- Data from the Maryland DNR Charter Boat Volunteer Survey were used to develop the length frequency distribution of the Maryland charter boat catch for each 2-week interval (Table 2A). Data from the Charter Boat Volunteer Survey were also used to develop the length frequency distribution for the Maryland private angler catch due to small samples of fish reported in the Volunteer Angler Survey (Table 2B).
- Harvest in each interval was distributed by the length frequency distribution for each 2-week interval.
- The number of migrants harvested in Maryland during the spring trophy season was determined by applying length-specific migration probabilities. These probabilities were derived from the estimate of the number of striped bass tagged on the spawning grounds in Maryland that migrate to the Atlantic coast before December of the first year at large (Dorazio et al. 1994). The result was a migrant and resident harvest estimate for each 2-week interval, distributed among interval-specific length groups (Table 3).
- The total 2011 Maryland spring harvest of coastal migrant striped bass in Chesapeake Bay was calculated as the sum of migrants over all length groups and 2-week intervals from both sectors (charter and private).



- The preliminary estimate of the migrant harvest for Virginia's portion of Chesapeake Bay was provided by VMRC, based on mandatory reporting by recreational anglers and charter boat captains.

### *Results and Discussion*

The estimate of the 2011 Chesapeake Bay spring migrant harvest is 35,327 fish, below the 2006-2011 average (Table 4). The Maryland portion of the Chesapeake Bay migrant harvest is 35,182 migrants (Table 1). The Maryland charter boat migrant harvest is 12,566 fish. The Maryland private boat migrant harvest is 22,616 fish. The VMRC preliminary estimate of the spring 2011 migrant harvest in Virginia is 145 fish. Spring migrant harvest by length group is similar in each year from 2006 to 2011 (Figure 1).

The increase in migratory striped bass harvest relative to 2010 occurred in the private sector. The charter boat estimate of migrant harvest has been consistent since 2008 (Table 4).

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- Jones, P. 2003. Estimates of the harvest of coastal migrant striped bass in Chesapeake Bay in the spring of 2003. Report to the ASMFC Striped Bass Technical Committee, November 2003.
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**Table 1.** 2011 Chesapeake Bay spring striped bass migrant harvest, distributed among 2-week intervals, based on data from Maryland charter boat log book reports, MRFSS Maryland recreational harvest estimate and VMRC reported migrant harvest (estimate as of 9/15/11).\* Shaded areas represent no harvest (before April 16<sup>th</sup>), no migrant harvest (after June 15<sup>th</sup>), or no data.

	Interval	Charter Harvest (% by interval) <sup>1</sup>	MD Charter Harvest <sup>1</sup>	MD Private Harvest <sup>2</sup>	MD Total Harvest	MD Charter Migrants	MD Private Migrants	MD Total Migrants	VA Migrants <sup>3</sup>	Bay Total Migrants		
<b>Wave 2</b>	Apr 1-15	0	0	0	0	0	0	0				
	Apr 16-30	100	7,815	7,282	15,097	5,929	5,525	11,454				
<b>Wave 3</b>	May 1-15	27	7,640	19,673	27,313	5,478	14,107	19,585				
	May 16-31	25	7,074	18,216	25,290	802	2,065	2,867				
	June 1-15	22	6,225	16,030	22,255	357	919	1,276				
	June 16-30	26	7,357	18,944	26,301							
	<i>Wave 3 total</i>	<i>100</i>	<i>28,296</i>	<i>72,863</i>	<i>101,159</i>							
<b>Season total</b>			28,754	61,201	89,955	12,566	22,616	<b>35,182</b>			<b>145</b>	<b>35,327</b>

\* – Numbers may not sum due to rounding

1 – Data from Maryland DNR charter logbooks

2 – Data from MRFSS

3 – Data from VMRC

**Table 2A.** Length distribution of the 2011 Maryland striped bass spring season harvest as voluntarily reported by charter boat captains, by 2-week intervals between April 16 and June 15. (Shaded areas represent no-take size groups.)

<b>Length Group</b>	<b>April 16-30</b>	<b>May 1-15</b>	<b>May 16-31</b>	<b>June 1-15</b>	<b>Total</b>
17	0	0	1	0	1
18	0	0	129	108	237
19	0	0	204	147	351
20	0	0	187	129	316
21	0	0	214	123	337
22	0	0	153	95	248
23	0	0	105	65	170
24	0	0	88	84	172
25	0	0	46	26	72
26	0	0	35	46	81
27	0	0	25	40	65
28	20	29	23	15	87
29	63	63	16	24	166
30	125	84	23	33	265
31	185	133	41	24	383
32	242	183	36	13	474
33	288	218	30	7	543
34	357	221	30	6	614
35	321	180	13	0	514
36	432	209	22	2	665
37	329	188	15	2	534
38	262	125	12	2	401
39	186	73	5	0	264
40	119	75	4	0	198
41	76	42	2	0	120
42	56	39	0	0	95
43	25	4	1	0	30
44	23	11	0	0	34
45	8	5	0	0	13
46	12	3	0	0	15
47	7	3	0	0	10
48	1	3	0	0	4
49	1	0	0	0	1
50	0	0	0	0	0
51	0	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	1	0	0	0	1
<b>n</b>	<b>3,139</b>	<b>1,891</b>	<b>1,460</b>	<b>991</b>	<b>7,481</b>

**Table 2B.** Length distribution of the 2011 Maryland striped bass spring harvest as reported by private anglers in 2 week intervals between April 16 and June 15. Due to small sample sizes, the length frequency distribution below was not used in 2011. Length frequency from Volunteer Charter Boat Survey (Table 2A) was used instead. Shaded areas represent no-take size groups.

<b>Length Group</b>	<b>April 16-30</b>	<b>May 1-15</b>	<b>May 16-31</b>	<b>June 1-15</b>	<b>TOTAL</b>
17	0	0	0	0	0
18	0	0	1	4	5
19	0	0	6	3	9
20	0	0	1	2	3
21	0	0	2	2	4
22	0	0	5	3	8
23	0	0	4	2	6
24	0	0	1	1	2
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	1	0	1
28	0	0	1	2	3
29	0	0	0	0	0
30	2	0	1	0	3
31	3	2	0	0	5
32	5	1	0	1	7
33	7	1	2	0	10
34	9	3	0	0	12
35	10	1	0	0	11
36	6	8	0	0	14
37	6	1	0	0	7
38	7	3	0	0	10
39	4	0	0	0	4
40	1	0	0	0	1
41	0	1	0	0	1
42	0	0	0	0	0
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	1	0	0	1
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
<b>n</b>	<b>60</b>	<b>22</b>	<b>25</b>	<b>20</b>	<b>127</b>

**Table 3.** 2011 Maryland spring striped bass migrant harvest, distributed among 1 inch length groups (length as total length).\*

Length Group	Apr 16-30			May 1-15		
	Charter	Private	Total	Charter	Private	Total
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28	6	6	12	15	39	54
29	30	28	58	49	126	176
30	87	81	168	95	244	339
31	178	166	344	208	535	743
32	305	284	589	374	964	1,338
33	448	417	865	550	1,417	1,967
34	649	605	1,253	652	1,678	2,330
35	651	607	1,258	592	1,525	2,118
36	943	879	1,822	741	1,907	2,648
37	754	703	1,457	699	1,801	2,500
38	619	577	1,197	480	1,235	1,714
39	448	418	866	286	735	1,021
40	290	271	561	297	765	1,062
41	187	174	361	168	432	599
42	138	129	267	156	403	559
43	62	58	120	16	41	58
44	57	53	110	44	114	158
45	20	19	38	20	52	72
46	30	28	58	12	31	43
47	17	16	34	12	31	43
48	2	2	5	12	31	43
49	2	2	5	0	0	0
50	0	0	0	0	0	0
51	0	0	0	0	0	0
52	0	0	0	0	0	0
53	0	0	0	0	0	0
54	0	0	0	0	0	0
55	0	0	0	0	0	0
56	2	2	5	0	0	0
<b>n</b>	<b>5,929</b>	<b>5,525</b>	<b>11,454</b>	<b>5,478</b>	<b>14,107</b>	<b>19,586</b>

\*Note: numbers may not sum due to rounding.

**Table 3.** 2011 Maryland spring striped bass migrant harvest, distributed among 1 inch length groups (continued).\*

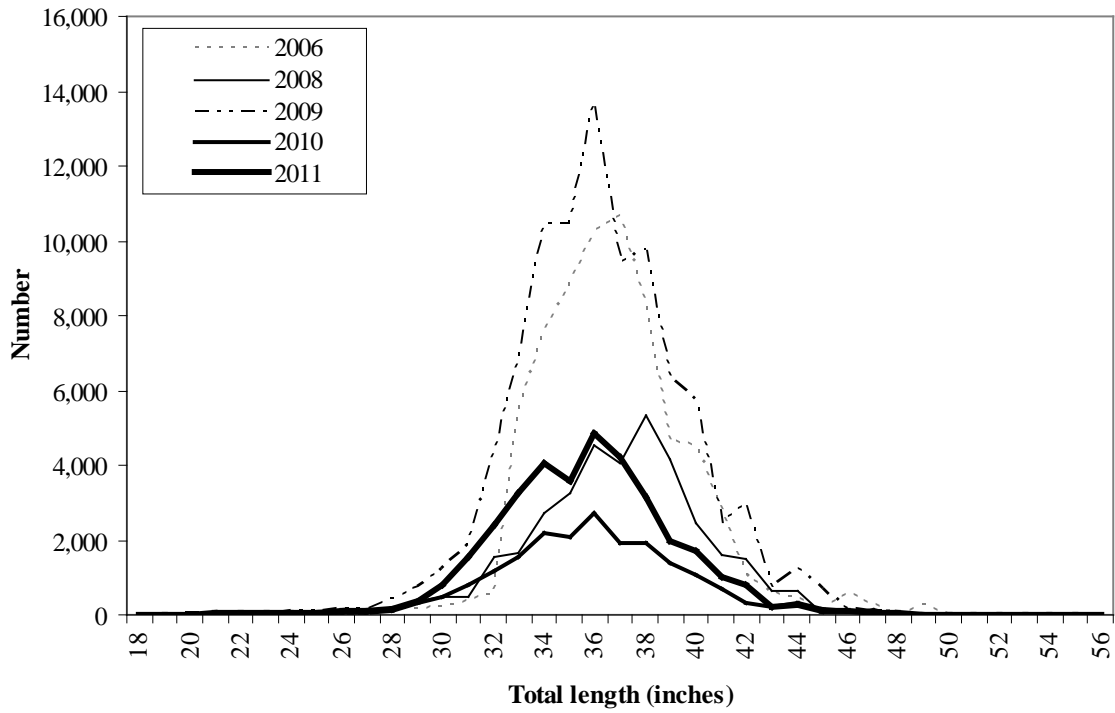
Length Group	May 16-31			June 1-15		
	Charter	Private	Total	Charter	Private	Total
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	3	7	10	2	6	9
21	5	13	18	4	10	14
22	6	15	21	5	12	17
23	7	17	23	5	14	19
24	9	23	32	11	28	39
25	7	19	26	5	14	19
26	9	23	32	15	39	55
27	10	26	36	21	54	75
28	14	37	51	12	31	43
29	15	39	53	29	75	104
30	31	80	111	58	149	207
31	77	198	275	58	150	208
32	88	227	316	41	106	148
33	91	234	325	27	71	98
34	106	273	379	28	71	98
35	51	132	183	0	0	0
36	93	241	334	11	28	39
37	67	172	239	12	30	41
38	55	142	197	12	31	43
39	23	60	84	0	0	0
40	19	49	68	0	0	0
41	10	25	34	0	0	0
42	0	0	0	0	0	0
43	5	12	17	0	0	0
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	0	0	0	0
47	0	0	0	0	0	0
48	0	0	0	0	0	0
49	0	0	0	0	0	0
50	0	0	0	0	0	0
51	0	0	0	0	0	0
52	0	0	0	0	0	0
53	0	0	0	0	0	0
54	0	0	0	0	0	0
55	0	0	0	0	0	0
56	0	0	0	0	0	0
<b>n</b>	<b>802</b>	<b>2,065</b>	<b>2,866</b>	<b>357</b>	<b>919</b>	<b>1,276</b>

\*Note: numbers may not sum due to rounding.

**Table 4.** Harvest of migrant striped bass in the spring fishery from 1992-2011 (Individual estimates not available for all sectors prior to 2006). Average was only calculated for 2006-2011 due to techniques used to calculate migrant harvest.

<b>Year</b>	<b>MD Charter Migrant Harvest</b>	<b>MD Private Migrant Harvest</b>	<b>VA Migrant Harvest</b>	<b>Total Migrant Harvest</b>
1992				1,013
1993				2,719
1994				3,672
1995				42,634
1996				11,613
1997				21,222
1998				10,021
1999				17,051
2000				26,748
2001				25,728
2002				14,839
2003	43,248		242	43,900
2004	31,218		186	31,404
2005	64,345		1,319	65,664
2006	15,570	47,878	4,323	67,771
2007	9,359	26,229	740	36,328
2008	13,106	22,785	275	36,166
2009	12,740	77,799	243	90,782
2010	12,504	7,261	82	19,847
2011	12,566	22,616	145	35,327
<b>Avg (2006-11)</b>	<b>12,641</b>	<b>34,095</b>	<b>968</b>	<b>47,704</b>

**Figure 1.** Comparison of Maryland's 2006 through 2011 spring striped bass migrant harvests, apportioned by length. 2007 is omitted due to slot length regulations in place that year.





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**Fisheries Research Branch**

**I. Introduction**

The ASMFC's efforts in enhancing the fishery stocks of this species along the Atlantic Coast have proven successful. The Fisheries and Wildlife Division of the District of Columbia has always supported the actions of the commission and followed all Amendments to the Interstate Fishery Management Plan for Atlantic striped bass. The striped bass population in District waters can be observed all year, but is most abundant from March through June during the spawning migration. Efforts to monitor the striped bass population include a monthly electrofishing survey and seasonal seining surveys. Additional electrofishing is conducted each spring in an effort to tag migrating striped bass.

**II. Request for de minimis, where applicable.**

Not applicable.

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

**A. Fishery Dependant Monitoring Programs**

**i. Commercial Fishery**

There is no commercial fishery in the District of Columbia.

**ii. Recreational Fishery**

(1.) Characterization of Recreational Fishery

- The recreational regulations for the 2011 fishing season for striped bass were as follows: Hook and Line fishing season was open from May 16th through December 31<sup>st</sup> with anglers permitted a creel of two fish per day, measuring at least 18" of which only one may exceed 28". The 2011 fishing regulations are displayed in Table 7 along with previous regulations.

(2.) Characterization of directed harvest

(a) Landings and method of estimation:

- The Fisheries Research Branch currently has no method of accumulating recreational catch data for the directed harvest of striped bass.

(b) Catch Composition

- The directed recreational fishery for striped bass consists primarily of shoreline anglers with a small number of boat based anglers. The prime period for the directed harvest in the District of Columbia is during May and June, with a smaller directed harvest from September through mid November. In the past the District's overall recreational fishery had

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been characterized by a random stratified angler creel survey during the months of May through November. The survey was suspended during the 2006 season due to a lack of personnel and has not been conducted since then.

- (c) Estimation of effort (where available)
  - No data is available for this section

- iii. **Other Losses (Poaching, Hook & Release Mortality, Bycatch, etc.)**
  - No data is available for this section

- iv. **Total Harvest & Losses**
  - No data is available for this section

**B. Fishery Independent Monitoring Programs**

- As part of the annual biological survey of the fishery resources of the District of Columbia, efforts were made to collect striped bass to determine relative abundance of adults and juveniles. Both life stages were collected during our electrofishing and seining surveys for abundance estimates, and juveniles collected during our seining surveys were used to calculate the YOY indices. Biological surveys were conducted monthly at five standard seining sites, and eight electrofishing sites, between the months of March and November. Four alternate electrofishing sites were sampled in May, July, September and November in the Potomac River. Specimens collected during these surveys were measured and weighed, then released. These surveys will continue in 2012.

**i. Results**

(1) Juvenile indices

- YOY indices calculated for striped bass during our standard seining surveys are presented in Table 1. Table 2 presents the arithmetic and geometric means of YOY indices broken down by river for the years 1992 through 2011. Table 3 presents the YOY and adult catch, by month, for our electrofishing and seining surveys. Table 4 presents a comparison of the geometric YOY indices for the District versus the Maryland indices for several river systems and the bay.

(2) Spawning stock assessment

- Due to the short period of time large, spawning adults are in the District, we electrofish the Potomac in the spring in an attempt to document the abundance and size of visiting spawning fish. In 2011 we had 5 special tagging outings between April 4<sup>th</sup> and May 16<sup>th</sup>.

(a) Length frequency

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- Table 5 presents data from 2009 through 2011 on the length at age frequency for striped bass in the District. This table is broken into frequency of scales read at each age, with an associated average length, and also an extrapolation to all fish sampled based on scale read length at age. The data is also graphically presented in Figure 1 and 2.

(b) Age frequency

- Table 5, Figure 1, and Figure 2 present the length at age frequency data for striped bass captured in 2011. Figure 1 includes all 228 striped bass sampled in 2011.

(c) Sex

- In 2011 we did not determine the sex of any of the striped bass sampled.

(3) Stock characterization

(a) Length frequency

- The striped bass stock in the District is primarily characterized through our seining and electrofishing surveys which were conducted monthly, from March through November, during 2011. These surveys provide us with the data needed to produce our young-of-year indices as well as our relative abundance estimates.

(b) Age frequency

- As noted above, Table 5 and Figure 2 present our age data for 2011.

(c) Sex

- Not Available.

(d) Catch per unit effort

- Our standard monthly electrofishing survey provides us with monthly relative abundance data. This data, for the years 2000 through 2011 is presented in Table 6. This data is based on the average catch over two, 10 minute shocking runs at each site sampled.

(4) Tagging

(a) Number of fish tagged

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- The Fisheries Research Branch tags striped bass throughout the year during our surveys. In 2011 we tagged 53 fish with US Fish and Wildlife Service tags. All data was submitted to FWS.

(5) Research Removals

- DC Fisheries recorded no research removals in 2011.

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

**A. Summarize regulations which will be in effect.**

- The Fisheries Research Branch will continue to mirror the striped bass regulations that are presented by neighboring jurisdictions (PRFC). The regulations for 2012 are as follows: Open Hook and Line season for striped bass from May 16<sup>th</sup> through December 31<sup>st</sup>. A creel limit of two fish a day with an 18" minimum size and only one striped bass over 28".

**B. Summarize monitoring programs that will be performed.**

- Seining surveys and Electrofishing surveys will continue in 2012 as a means of monitoring YOY populations and reproductive success in the waters of the District of Columbia. Special electrofishing events targeting large migratory striped bass will also continue with the purpose of tagging harvestable fish that are found only briefly in this jurisdiction.

**C. Highlight any changes from the previous year.**

- The seining survey was modified in 2010 from a once a month sampling event over a nine month span, to a bimonthly event that focused on the time when YOY may actually be observed in District waters. The survey began in June and was performed bimonthly through October. The number of sampling events remained the same, but the effort was concentrated on the time of year when YOY were actually present.

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**Table 1  
Young-of-Year Index for Striped Bass  
(Seining)  
(2011)**

<b>DATES</b>	<b>Site</b>						<b>YOY Totals</b>
	<b>A1</b>	<b>A2</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	
<b>6/8/2011</b>	0	0	0	0	1	0	1
<b>6/23/2011</b>	15	27	4	5	7	2	60
<b>7/7/2011</b>	57	26	3	9	42	8	145
<b>7/28/2011</b>	7	0	0	1	12	8	28
<b>8/8/2011</b>	7	0	0	1	19*	5	32
<b>8/24/2011</b>	1	0	1	4	15	0	21
<b>9/27/2011</b>	0	0	0	0	0	0	0
<b>10/6/2011</b>	0	0	0	0	0	0	0
<b>10/24/2011</b>	0	0	0	0	0	0	0
<b>YOY Totals</b>	<b>87</b>	<b>53</b>	<b>8</b>	<b>20</b>	<b>96</b>	<b>23</b>	<b>287</b>
<b>Index<sup>1</sup></b>	<b>9.67</b>	<b>5.89</b>	<b>0.89</b>	<b>2.22</b>	<b>10.67</b>	<b>2.56</b>	<b>5.31</b>
<b>Index<sup>2</sup></b>	<b>17.4</b>	<b>26.5</b>	<b>2.67</b>	<b>4</b>	<b>16</b>	<b>5.75</b>	<b>11.48</b>

**Total YOY collected= 287**

**YOY Index (with all sites combined) = 5.31**

**YOY Index<sup>1</sup> (with only those sites where YOY were actually collected) = 11.48**

**Anacostia YOY Index<sup>1</sup> = 20.00**

**Potomac YOY Index<sup>1</sup> = 8.17**

**\*includes 1 non YOY**

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**Table 2  
Arithmetic and Geometric Means of YOY Striped Bass  
From the Potomac and Anacostia Rivers in the District of Columbia  
(Seining Survey 1992-2011)**

Years	YOY Index <sup>1</sup>		Geometric Mean
	Potomac	Anacostia	
1992	1	2	1.41
1993	5.8	60.4	18.72
1994	9.5	4	6.16
1995	1.33	16.67	4.71
1996	1.5	5.75	2.94
1997	22.86	12.8	17.11
1998	3.33	9.25	5.55
1999	16.25	6.6	10.36
2000	0.25	6	2.45
2001	3	42	11.22
2002	0	9	3
2003	1.89	4.5	2.92
2004	1.86	17.5	5.7
2005	3.4	6.67	4.76
2006	4	15	7.75
2007	1.5	2.5	1.94
2008	0	1	1
2009	1.1	13.7	3.88
2010	4.42	6.67	5.43
2011	20	8.17	12.78
<b>Average</b>	<b>5.1495</b>	<b>12.509</b>	<b>6.4895</b>

**YOY Index<sup>1</sup>** = Calculated from only those sites where YOY were actually collected

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**Table 3  
Young of the Year and Adults Captured by  
Seining and Electrofishing - (2011)**

Months	Seining			Electrofishing			Total
	YOY	Adults	Total	YOY	Adults	Total	Seining & Electrofishing
Mar	*	*	*	0	2	2	2
Apr	*	*	*	0	4	4	4
May	*	*	*	0	17	17	17
Jun	61	0	61	0	3	3	64
Jul	173	0	173	0	2	2	175
Aug	52	1	53	0	4	4	57
Sep	0	0	0	0	5	5	5
Oct	0	0	0	0	5	5	5
Nov	0	0	0	0	2	2	2
Dec	*	*	*	*	*	*	*
<b>TOTAL</b>	<b>286</b>	<b>1</b>	<b>287</b>	<b>0</b>	<b>44</b>	<b>44</b>	<b>331</b>

(\*) – No sample taken

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**Table 4  
Maryland striped bass juvenile Indices (1992-2011)  
Geometric mean of catch-per-haul  
Compared with that of District of Columbia**

<b>Year</b>	<b>Head of Bay</b>	<b>Potomac River</b>	<b>Choptank River</b>	<b>Nanticoke River</b>	<b>Bay-wide</b>	<b>D.C.</b>
<b>1992</b>	0.87	6	2.07	1.72	2.34	<b>1.41</b>
<b>1993</b>	15	15.96	27.87	4.9	13.97	<b>18.72</b>
<b>1994</b>	12.88	2.01	7.71	9.06	6.4	<b>6.16</b>
<b>1995</b>	2.85	4.47	9.96	3.76	4.41	<b>4.71</b>
<b>1996</b>	14.92	13.45	33.29	18.8	17.46	<b>2.94</b>
<b>1997</b>	6.15	3.67	3.95	1.74	3.91	<b>17.11</b>
<b>1998</b>	4.32	4.42	21.1	2.74	5.5	<b>5.55</b>
<b>1999</b>	1.91	5.84	20.01	5.52	5.34	<b>10.36</b>
<b>2000</b>	8.84	3.52	12.53	10.86	7.42	<b>2.45</b>
<b>2001</b>	7.15	5.01	86.71	20.31	12.57	<b>11.22</b>
<b>2002</b>	1.35	3.95	0.38	4.89	2.2	<b>3</b>
<b>2003</b>	11.89	12.81	20.56	3.25	10.83	<b>2.92</b>
<b>2004</b>	4.17	2.36	9.52	9.65	4.85	<b>5.7</b>
<b>2005</b>	8.48	7.92	16.81	1.07	6.91	<b>4.76</b>
<b>2006</b>	0.95	2.42	2.81	1.65	1.78	<b>7.75</b>
<b>2007</b>	8.21	2.2	7.87	5.41	5.12	<b>1.94</b>
<b>2008</b>	2.33	1.4	0.34	0.73	1.26	<b>1</b>
<b>2009</b>	2.85	3.75	6.61	4.18	3.92	<b>3.88</b>
<b>2010</b>	2.9	2.17	2.23	2.96	2.54	<b>5.43</b>
<b>2011</b>	5.79	7.18	26.14	12.99	9.57	<b>12.78</b>
<b>Average</b>	<b>6.19</b>	<b>5.53</b>	<b>15.92</b>	<b>6.31</b>	<b>6.42</b>	<b>6.49</b>



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**Table 5  
Frequency at age for Striped Bass, 2009 – 2011**

YEAR	AGE (yrs)	SCALES		COMPOSITE
		Frequency	Average Length (mm)	Frequency
<b>2009</b>	1	9	170	16
	2	25	250	26
	3	20	321	20
	4	10	416	10
	5	12	485	9
	6	15	538	10
	7	8	634	16
	8	10	759	7
	9	11	864	15
	10	19	938	16
	11	13	984	12
	12	8	1012	10
	13	5	1063	3
	14	1	1060	3
<b>2010</b>	1	18	186	25
	2	15	251	14
	3	11	344	13
	4	9	441	12
	5	20	508	14
	6	7	577	12
	7	4	665	3
	8	1	838	1
	9	2	902	4
	10	3	946	4
	11	7	973	5
	12	4	1045	2
	13	4	1035	5
<b>2011</b>	1	7	167	11
	2	14	235	16
	3	14	300	14
	4	8	456	8
	5	2	501	2
	6	7	654	7
	7	2	762	2
	8	1	773	1
	9	4	870	4
	10	7	963	7
	11	9	1002	9
	12	9	1050	9
	13	6	1130	6

**DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
2011 ANNUAL STATE REPORT FOR STRIPED BASS**

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**Table 6  
Electrofishing Relative Abundance of Striped Bass  
2000 – 2011**

Lower Anacostia River (A1E)												
Month	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Feb	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
March	0	0	0.5	0	NST	0	0	0	0	0	0	0
April	0	NST	0	0	NST	0.5	0	0	0	0	0	0
May	0	2.5	1	0	0	0.5	0	0	0	0	0.5	0
June	0	1.5	0.5	0	0	0	3.5	0	0	0.5	0	0
July	0	0	0	0	2	1.5	2	0	0	0.5	0	0
Aug	0	2.5	0	0	2	0	0	0	0.5	0	0.5	0.5
Sep	0	1	0	0	1	0	0	0	3.5	0	0.5	1
Oct	2	0	0	0	1	1	NST	1.5	1	1.5	0	1
Nov	0	0	0	0	1	0	0	0	0	0	0	0
Dec	NST	0.5	NST	0	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	0.22	0.89	0.22	0	1	0.39	0.61	0.17	0.56	0.28	0.17	0.28
Upper Anacostia (A2E)												
Month	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Feb	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
March	0	0	0.5	0	NST	0	0	0	0	0	0.5	0
April	0	NST	0	0	NST	0	0	0	0	0	0	0
May	0	14	0	0	0	0	0	1	1	0	0	0
June	0.5	0	0.5	0.5	1.5	0	0.5	0	0	1	0	0
July	1.5	1	1	0	1.5	8.5	0.5	1	7	3.5	0.5	0.5
Aug	0	–	1.5	0	1	0.5	1	1.5	3.5	1.5	0	1.5
Sep	0.5	1	0.5	0.5	0.5	1	0	0	5	1.5	0.5	0
Oct	0	2	0	0.5	2	0	NST	2	1	0	0.5	0.5
Nov	0	0	0	0	0	1	0	0.5	0	0	0	0
Dec	NST	0	NST	0	NST	NST	NST	NST	NST	NST	NST	NST
<b>Year Avg</b>	0.28	2	0.44	0.15	0.93	1.22	0.25	0.67	1.94	0.83	0.22	0.28

**NST = No Sample Taken**

**DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
2011 ANNUAL STATE REPORT FOR STRIPED BASS**

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**Table 6  
Electrofishing Relative Abundance of Striped Bass  
2000 – 2011**

<b>Washington Channel (W1E)</b>												
<b>Month</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feb	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
March	0	0	0	0	NST	0	0	0	0	0	0	0
April	0	NST	0	0	NST	0	0	0	0.5	0	0	0
May	0	1	0	1	0.5	0.5	0	0	0	0	0	0
June	0	1	0	0.5	2.5	0	1	0	1	1	0	0
July	0	1	0	0.5	1	0	0	0	0	0	1	0
Aug	0	2	0.5	0	1	0	0	0.5	0	0	0	0
Sep	0	0	0	0	1.5	0	0	0.5	0	0	0	0
Oct	0	0	1.5	0	8.5	0	NST	1.5	0.5	2	0.5	0
Nov	0	0	1	0	0	0	0	0.5	0.5	0	0	0
Dec	NST	0	NST	0	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	0	0.56	0.33	0.2	2.14	0.06	0.11	0.33	0.28	0.33	0.17	0.00
<b>Lower Potomac River (P1E)</b>												
<b>Month</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feb	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
March	0.5	0	0.5	0.5	NST	0	0	0.5	0	0	0	1
April	0	NST	1.5	0	NST	0	0.5	0	0	0	0	0
May	0.5	0	0	0	1	0.5	NST	0	6	0.5	2	3.5
June	0	1	0.5	0.5	0.5	1	0	0	2.5	1	0	0.5
July	0	0	0.5	0	2.5	1.5	0.5	1	0.5	1	0	0
Aug	1	5	0.5	0	1.5	0.5	0	1	0.5	0	0.5	0
Sep	0	0	0	1.5	1	1.5	1	1.5	0.5	0.5	1	0
Oct	5.5	0	0	0	0	0.5	NST	11	0.5	0.5	1	0
Nov	0.5	0	0	0	0.5	0.5	0	0.5	0.5	0.5	0.5	0.5
Dec	NST	1	NST	0	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	0.89	0.78	0.39	0.25	1	0.67	0.25	1.77	1.22	0.44	0.56	0.61

**NST = No Sample Taken**

**DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
2011 ANNUAL STATE REPORT FOR STRIPED BASS**

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**Table 6  
Electrofishing Relative Abundance of Striped Bass  
2000 – 2011**

<b>Middle Potomac River – National Airport (P2E)</b>												
<b>Month</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Feb</b>	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
<b>March</b>	0	0	0	0	NST	0	0	0	0	0	0	0
<b>April</b>	0	NST	0	0	NST	0	0.5	0	0	0	2.5	0.5
<b>May</b>	1	1	0	0	0	2.5	7.5	0	1	1.5	1.5	0.5
<b>June</b>	0	0	0	0	0	0	1	0.5	0	1	0.5	0.5
<b>July</b>	0	0	0	0	0	0.5	0	0.5	0.5	0	0	0
<b>Aug</b>	0	0	0	0.5	0	1	0	0	0	0	1	0
<b>Sep</b>	0.5	0	0	0	0.5	0	0.5	0.5	1	0.5	0.5	0.5
<b>Oct</b>	0	0	0	0	0	0	NST	3.5	1	0	2.5	0
<b>Nov</b>	0	0	0	0	1.5	0	0	0.5	0	0.5	0.5	0.5
<b>Dec</b>	NST	0	NST	0.5	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	0.17	0.11	0	0.1	0.29	0.44	0.5	0.61	0.39	0.39	1.00	0.28
<b>Middle Potomac River – Roosevelt Island (P3E)</b>												
<b>Month</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Feb</b>	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
<b>March</b>	0	0	0	0	NST	0	0	0	0	0	0	0
<b>April</b>	0	NST	0	0	NST	0	0	1.5	0.5	0	0	1.5
<b>May</b>	0	6	6	0.5	0.5	0	0	0.5	2.5	3	0.5	1
<b>June</b>	0	0	0	15	0.5	0	0	0	0	3.5	0.5	0.5
<b>July</b>	0	1	0	0	1	0.5	0.5	0	0	0	0	0
<b>Aug</b>	0	0	0	0.5	1.5	0.5	0	0	0	0	0.5	0
<b>Sep</b>	1\NST	0	0	2	3	0.5	0	0	0	0	0	0
<b>Oct</b>	1\NST	0	0	0	0	0	NST	0	0	0	0.5	0
<b>Nov</b>	0	0	0	0	1	0	0	0	0	0	0	0
<b>Dec</b>	NST	0	NST	0	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	0	0.78	0.67	1.8	1.07	0.17	0.06	0.22	0.33	0.72	0.22	0.33

**NST = No Sample Taken**

**DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
2011 ANNUAL STATE REPORT FOR STRIPED BASS**

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**Table 6  
Electrofishing Relative Abundance of Striped Bass  
2000 – 2011**

<b>Lower Rock Creek (P3AE)</b>												
<b>Month</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Feb</b>	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
<b>March</b>	0	0	0	0	NST	0	0	0	0	0	0	0
<b>April</b>	0	NST	0	0	NST	0	0	0	0	0	0	0
<b>May</b>	0	5.5	4.5	0.5	2.5	1.5	0.5	1	6.5	0.5	1.5	1.5
<b>June</b>	11	7.5	4	1.5	2	0.5	2	0	1	0	4.5	0
<b>July</b>	0	5	1	0.5	3	1.5	2.5	1.5	0.5	2.5	0.5	0.5
<b>Aug</b>	2	10	1	11.5	2	1	0	0	0	0.5	3	0
<b>Sep</b>	2.5	2	2	1	2	1	0.5	3.5	0.5	0	0	0.5
<b>Oct</b>	0	0	2	1	1	0	NST	0.5	0.5	0	0	1
<b>Nov</b>	0	0	0	0	0	0	0	0	1	0	0	0
<b>Dec</b>	NST	0	NST	0	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	1.72	3.33	1.61	1.6	1.79	0.61	0.61	0.72	1.11	0.39	1.06	0.39
<b>Upper Potomac River (P4E)</b>												
<b>Month</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Feb</b>	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
<b>March</b>	0	0	0	0.5	NST	0	0	0	0	0	0	0
<b>April</b>	0	NST	0	0.5	NST	0	0	0	0	0	0	0
<b>May</b>	0	1	2	3	0	1	0	0.5	2	0	0	1.5
<b>June</b>	0	0	0	7	3	0	0	0	0	0.5	0	0
<b>July</b>	0	0	0	0	0	1	0	0	0	0	1	0
<b>Aug</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sep</b>	0	0	0	0	1	0	0	0	0	0	0	0
<b>Oct</b>	0	0	0	0.5	0.5	0	NST	0	0	0	0.5	0
<b>Nov</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Dec</b>	NST	0	NST	0	NST	NST	0	NST	NST	NST	NST	NST
<b>Year Avg</b>	0	0.11	0.22	1.15	0.64	0.22	0	0.06	0.22	0.06	0.17	0.17
<b>Overall</b>	<b>0.41</b>	<b>1.07</b>	<b>0.49</b>	<b>0.66</b>	<b>1.11</b>	<b>0.47</b>	<b>0.3</b>	<b>0.57</b>	<b>0.73</b>	<b>0.43</b>	<b>0.44</b>	<b>0.29</b>

**NST = No Sample Taken**

**DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
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**Table 7  
District of Columbia Recreational Fishery Regulations for Striped Bass**

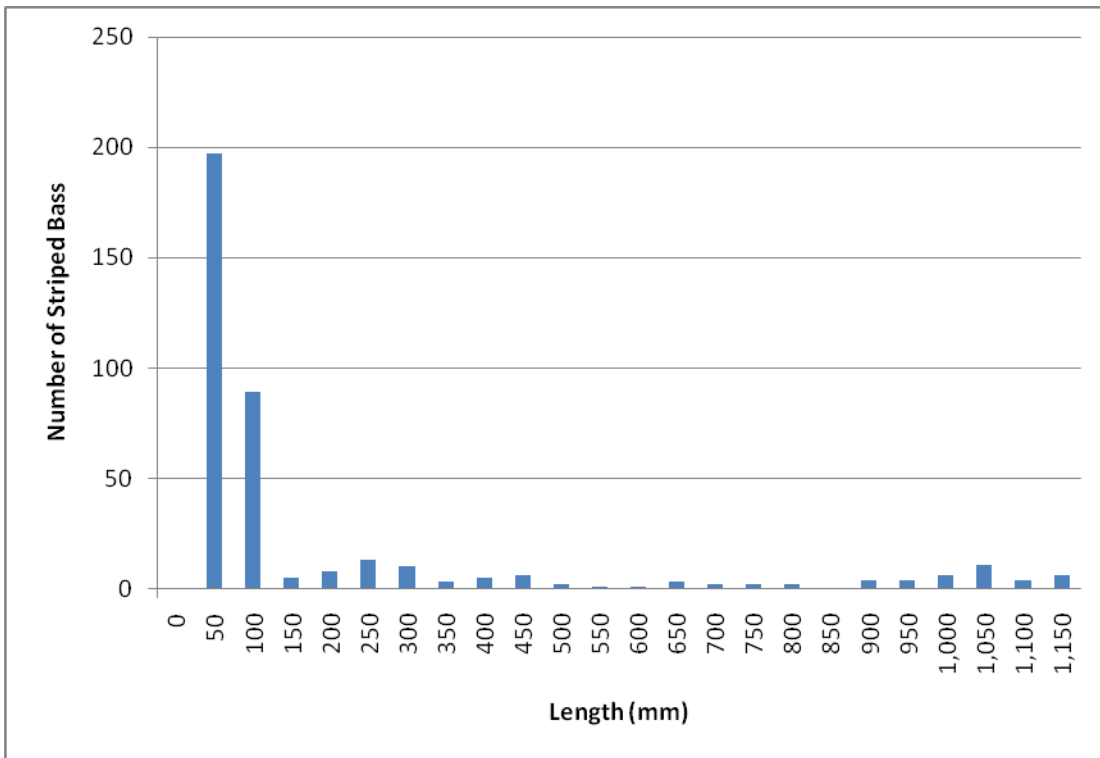
YEAR	SIZE LIMIT	DAILY CREEL LIMIT	SEASONAL QUOTA	OPEN SEASON	
March 1987 to August 4, 1989	24"	2 Fish	NONE	No restriction	
August 1989 to 1991	<b>MORATORIUM (IN LINE WITH OTHER ATLANTIC STATES)</b>				
1992	MIN	18"	2 fish	NONE	Oct 5 - Nov 16
	MAX	36"			
1993	MIN	18"	1 Fish	NONE	Jun 7 - Nov 30
	MAX	36"			
1994	MIN	18"	1 fish	NONE	Jun 5 - Nov 19
	MAX	36"			
1995	MIN	18"	1 Fish	NONE	Jun 5 - Jul 31 (August closed)
	MAX	36"			
1996	MIN	18"	1 Fish	NONE	Jun 3 - Jul 31 (August closed)
	MAX	36"			
1997	MIN	18"	1 Fish	NONE	June 3 - Jul 31 (August closed)
	MAX	36"			
1998	MIN	18"	1 Fish	NONE	June 3-Jul 31 (August closed)
	MAX	36"			
1999	MIN	18"	1 Fish	NONE	June 1-Jul 31 (August closed)
	MAX	36"			
2000	MIN	18"	1 Fish	NONE	June 4-Jul 31 (August closed)
	MAX	36"			
2001	MIN	18"	1 Fish	NONE	June 4-Jul 31 (August closed)
	MAX	36"			
2002	MIN	18"	2 Fish	NONE	May 4 - July 31 (August closed) Sept. 1-Nov. 17
2003-2007	MAX	36"	2 Fish	NONE	May 1 – Nov. 19
	MIN	18"			
2008-2011	MIN	18"	2 Fish (only one may exceed 28")	NONE	May 16 –Dec. 31

**NOTE:**

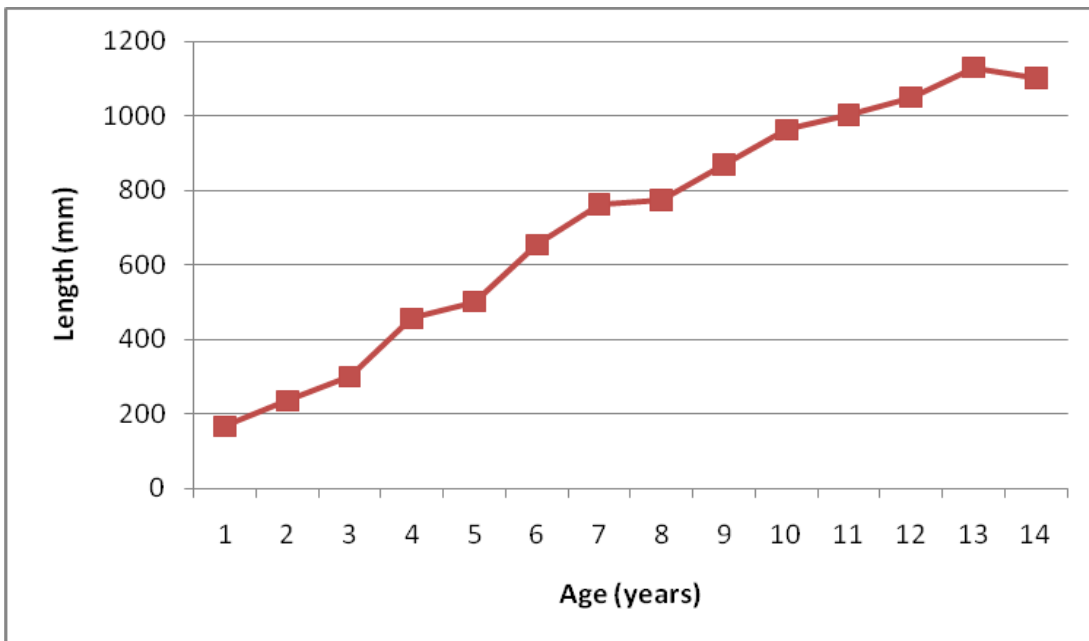
1. Violation of a size limit will not be tolerated.
2. The starting and ending dates of the open season are inclusive.
3. The method of fishing is only hook and line.
4. The recreational catch will not be offered for sale.
5. A D.C. Fishing License is required.
6. These rules are consistent with Atlantic States Marine Fisheries Commission's Management Guidelines.

**DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
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**Figure 1** - Length frequency of all striped bass collected in District waters, 2011.



**Figure 2** – Length at age for striped bass from scale age readings, 2011.

***DISTRICT OF COLUMBIA FISHERIES & WILDLIFE MANAGEMENT DIVISION  
2011 ANNUAL STATE REPORT FOR STRIPED BASS***

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## Potomac River Fisheries Commission

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# Atlantic Striped Bass 2011 Annual State Report June 1, 2012

## I. Introduction

The 2011 Potomac River striped bass fishery operated under the Maryland (DNR)/Virginia (MRC)/Potomac River Fisheries Commission (PRFC) joint Chesapeake Bay target cap. PRFC's share of the total bay-wide target cap was 1,343,812 pounds, which was then divided among the various user groups of the fishery. The commercial fisheries were further sub-divided by gear type. There were no substantive changes in the regulations from the previous year.

## II. Request for *de minimis*, where applicable - N/A

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

### A. Fishery Dependent Monitoring Program

#### i. Commercial fishery

##### (1) Characterization of fishery

Commercial fisheries in the Potomac continued to operate under the individual fish tagging system and mandatory daily harvest reporting requirements as used in previous years. The commercial fish tagging system requires each striped bass harvested be individually tagged prior to landing. A fixed number of tags – based on the estimated size of fish available, the number of fishermen, and the target cap for each gear type's fishery – were issued to each fisherman prior to the opening of a gear specific season. The commercial gear types used in the Potomac to harvest striped bass include gill net, pound net, commercial hook and line, haul seine, fyke net, fish trot line and fish pot. Each fisherman is required to file detailed daily harvest reports for each gear type used. The different gear types had various seasons from January 1 through March 25, and again between June 1 and December 31. The minimum size limit for all commercial fisheries was 18 inches, with a 36-inch maximum size limit between January 1 and March 25 for all gears.

##### (2) Characterization of directed harvest

###### (a) Landings and method of estimation

Striped bass landings in 2011 totaled 694,151 pounds. The estimate is from the PRFC's mandatory commercial daily harvest reporting system. Table 1 includes information on the mean sizes and effort data. Table 2 provides harvest data by month, area, gear and market categories. Figure 1 illustrates the annual commercial harvest.

(b) Catch composition

Samples purchased from fish houses were transported to VIMS where age, length, weight and sex of each fish were obtained. A total of 179 fish, weighing approximately 1,006 pounds were examined. The data shows eight year classes represented in the 2011 fishery and the assessment reveals that about nineteen percent were female. Other details of the sampling can be seen in Table 3.

(c) Estimation of effort

Gill net effort is expressed as “yards” of gill net fished, and the commercial hook and line effort is expressed as “hours” fished. The pound net fishery effort is expressed as “net days”, which is one pound net fished one time. The term “gear days” is used to express the effort for the miscellaneous gear types. Effort data by gear type is found in Table 1.

**ii. Recreational Fishery**

(1) Characterization of fishery

The recreational fishery is capped as part of the MD/VA/PRFC Chesapeake Bay target cap. It is further regulated by daily creel limits and fixed season lengths. The recreational season opened the third Saturday of April with a limited 30-day spring season which was further restricted by a minimum size limit of 28” and a single fish creel limit. In addition, only the lower half of the river was open during this spring season. The traditional summer/fall season opened May 16 and ran through December 31 with an 18-inch minimum size limit and a 2-fish creel limit with only one over 28 inches.

The charter boat fishery is capped as part of the MD/VA/PRFC Chesapeake Bay target cap. It is further regulated by daily creel limits and fixed season lengths. The charter boat season opened the third Saturday of April with a limited 30-day spring season which was further restricted by a minimum size limit of 28” and a single fish creel limit. In addition, only the lower half of the river was open during this spring season. The traditional summer/fall season opened May 16 and ran through December 31 with an 18-inch minimum size limit and a 2-fish creel limit with only one over 28 inches.

(2) Characterization of directed harvest

(a) Landings and method of estimation

The PRFC no longer requires the permit system and we buy ‘adds-on’ to the MRFSS telephone interviews. The estimated landed numbers are included within the MD and VA combined MRFSS estimate for the Chesapeake Bay and its tributaries.

(b) Catch composition

The catch composition data is included within the MD and VA combined MRFSS estimate for the Chesapeake Bay and its tributaries.

(c) Estimation of effort

The estimation of the effort data is included within the MD and VA combined MRFSS estimate for the Chesapeake Bay and its tributaries.

**iii. Other losses**

(1) Estimate and method of estimation

No Potomac River specific poaching information for striped bass is available; therefore we use the ASMFC mandated fifteen percent of the harvest, or 14,419 fish weighing 104,123 pounds. The mandatory commercial harvest catch reporting system includes information on fish discards. We estimate no losses in discards in the pound net fishery, and no losses of small fish in the gill net fishery. We use the eight percent ASMFC mandated hook and release mortality to calculate the by-catch losses for that segment of the fishery, and an eight percent released mortality for the miscellaneous gear. For 2011 we estimate a loss of 447 fish weighing 3,164 pounds (Table 4).

For the recreational fishery, the number of released fish, and therefore the hook and release mortality estimate must be obtained from the MD and VA combined MRFSS estimate for the Chesapeake Bay and its tributaries.

All charter boat captains operating in the Potomac River must be licensed by PRFC. License list are provided to NMFS so that all PRFC charter boats are monitored through the NMFS "For-Hire" survey. The estimated harvest and losses are included within the Maryland and Virginia Chesapeake Bay and its tributaries data (all Potomac River harvested fish are landed in either MD or VA).

(2) Estimate of composition

Based on the discard information supplied through the commercial mandatory harvest reporting system, 99.8 percent of the by-catch released were listed as "too small" (i.e. under 18 inches), and 0.2 percent were reported as released during the closed season. No information on size or age of the other discards is available.

The estimated recreational catch composition must be obtained from the MD and VA combined MRFSS estimate for the Chesapeake Bay and its tributaries. No specific age or length frequency data for the charter boat fishery exist.

**iv. Total Harvest and Losses**

This summary is found in Table 4.

**B. Fishery Independent Monitoring Programs**

The fishery independent monitoring programs (JI, SSB and Tagging) in the Potomac are performed and reported by Maryland Department of Natural Resources. The 2011 Geometric Mean Index for YOY striped bass in the Potomac River is presented in Figure 2. The 2011 value increased significantly from the 2010 value. Refer to the MD DNR website for additional information about the juvenile abundance survey: [www.dnr.state.md.us/fisheries/juvinindex/index.html](http://www.dnr.state.md.us/fisheries/juvinindex/index.html) .

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

##### **A. Summarize regulations that will be in effect**

New regulation effective January 1, 2011 – all pound nets in the Potomac River must have at least six PRFC approved fish cull panels properly installed in each pound net to help release undersize fish. These fish cull panels were being used by some pound netters on a voluntary basis prior to 2011. Otherwise, same as listed in harvest and losses for the commercial fishery, charter boat fishery and the recreational fishery.

##### **B. Summarize monitoring programs that will be performed**

We will continue sampling the harvest for length, weight, sex and age; and will continue mandatory daily harvest reporting for commercial fisheries.

##### **C. Highlight any changes from the previous year**

No substantive regulatory changes.

#### **V. Tables and Figures**

##### **List of Tables**

- Table 1 Commercial Data by Gear Type
- Table 2 Commercial Data by Month, Area, Gear and Size
- Table 3 Age, Sex, Length, and Weight Data
- Table 4 Summary of Harvest and Losses
- Table 5 Commercial Harvest by Gear Type (1964 – 2011)

##### **List of Figures**

- Figure 1 Annual Commercial Harvest
- Figure 2 Striped Bass YOY

### Commercial Data by Gear Type Potomac River - 2011

	<u>Number</u>	<u>Pounds</u>	<u>Mean Per Fish Pounds</u>	<u>Effort Data (Units)</u>
<b>Commercial</b>				
Gill Net	57,213	502,325	8.78	2,920,134 (yds)
Pound Net	33,332	152,268	4.57	892 (net days)
Hook and Line	4,512	32,165	7.13	4,999 (hrs.)
Miscellaneous	<u>1,069</u>	<u>7,393</u>	6.92	383 (gear days)
Sub-Total	96,126	694,151		

**TABLE 2**

### Commercial Data by Month, Area, Gear and Size Potomac River – 2011

<b>By Month</b>	<u>Jan.</u>	<u>Feb.</u>	<u>March</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>	<u>Total</u>
Pounds	50,685	154,227	262,335	28,428	2,727	1,370	8,176	27,316	70,868	88,019	694,151
%	7.30	22.22	37.79	4.10	0.39	0.20	1.18	3.94	10.21	12.68	100
Numbers	7,445	17,551	25,763	13,984	622	330	1,735	5,415	10,856	12,425	96,126

<b>By Area</b>	<u>Upper</u>	<u>Upper Middle</u>	<u>Lower Middle</u>	<u>Lower</u>	<u>Total</u>
Pounds	7,250	85,522	154,212	447,167	694,151
%	1.04	12.32	22.22	64.42	100

<b>By Gear</b>	<u>Gill Net</u>	<u>Pound Net</u>	<u>Hook and Line</u>	<u>Miscellaneous</u>	<u>Total</u>
Pounds	502,325	152,268	32,165	7,393	694,151
%	72.36	21.94	4.63	1.06	100

<b>By Size</b>	<u>Mixed</u>	<u>18"- 6 lbs</u>	<u>6 lbs &amp; up</u>	<u>Total</u>
Pounds	405,183	43,681	245,287	694,151

Table 3

**Striped Bass Age, Length, and Weight  
Potomac River - 2011**

<b>Year Class</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Total</b>
<b>Age</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	
<b>Males</b>										
Number	0	0	3	3	3	9	33	60	34	145
% by Year class	0.00%	0.00%	2.07%	2.07%	2.07%	6.21%	22.76%	41.38%	23.45%	
Av.Total Length (in)	0.00	0.00	33.60	31.00	29.76	26.80	23.86	22.84	22.21	
Av. Weight (lbs)	0.00	0.00	14.67	12.08	10.99	8.24	5.59	4.63	4.00	
<b>Females</b>										
Number	1	0	2	2	1	0	4	10	14	34
% by Year class	2.94%	0.00%	5.88%	5.88%	2.94%	0.00%	11.76%	29.41%	41.18%	
Av.Total Length (in)	36.80	0.00	34.32	32.66	31.52	0.00	24.16	22.96	22.52	
Av. Weight (lbs)	22.96	0.00	16.29	14.06	13.24	0.00	5.34	4.77	3.92	
<b>Sexes Combined</b>										
Number	1	0	5	5	4	9	37	70	48	179
% by Year class	0.56%	0.00%	2.79%	2.79%	2.23%	5.03%	20.67%	39.11%	26.82%	
Av. Total Length (in)	36.80	0.00	33.89	31.66	30.20	26.80	23.90	22.86	22.30	
Av. Weight (lbs)	22.96	0.00	15.32	12.87	11.55	8.24	5.56	4.65	3.97	

**TABLE 4**

**Summary of Harvest and Losses**

	<u>Number</u>	<u>Pounds</u>	<u>Mean Per Fish Pounds</u>	<u>Effort Data (Units)</u>
<b>Commercial</b>				
Gill Net	57,213	502,325	8.78	2,920,134 (yds)
Pound Net	33,332	152,268	4.57	892 (net days)
Hook and Line	4,512	32,165	7.13	4,999 (hrs.)
Miscellaneous	<u>1,069</u>	<u>7,393</u>	6.92	383 (gear days)
Sub-Total	96,126	694,151		
<b>Charter**</b>	<i>See "For-Hire" Survey</i>			
<b>Recreational***</b>	<i>See MRFSS</i>			
<b>ASMFC Mandated Adjustments</b>				
Poaching (15% of Harvest)	14,419	104,123	7.22	
Hook & Release (8 %)	361	2,573	7.13	
Misc. Catch & Release (8 %)	86	591	6.91	
 Total	 110,992	 801,438		

\* 2011 Harvest caps – PRFC is part of MD/VA/PRFC Bay wide cap.

\*\* 2011 Harvest caps – Charter Boats are monitored through the NMFS “For-Hire” survey and estimated harvest and losses are included within the Maryland Virginia Chesapeake Bay and its tributaries data (all Potomac River harvested fish are landed in either MD or VA).

\*\*\* Recreational fisheries are monitored through the NMFS-MRFSS and estimated harvest and losses are included within the Maryland and Virginia combined MRFSS estimate for the Chesapeake Bay and its tributaries (all Potomac River harvested fish are landed in either MD or VA).

**TABLE 5**



Potomac River Commercial Harvest (lbs) for **STRIPED BASS** by gear type

YEAR	HAUL SEINE	POUND NET	FYKE NET	GILL NET	H & L	MISC.	LBS LANDED IN		TOTAL
							MARYLAND	VIRGINIA	
1964	-	-	-	-	-	1,174,752	372,295	802,457	1,174,752
1965	-	-	-	-	-	1,530,365	491,095	1,039,270	1,530,365
1966	-	-	-	-	-	1,231,205	361,900	869,305	1,231,205
1967	-	-	-	-	-	1,342,033	545,278	796,755	1,342,033
1968	-	-	-	-	-	1,155,227	368,110	787,117	1,155,227
1969	-	-	-	-	-	979,645	453,937	525,708	979,645
1970	-	-	-	-	-	830,483	373,010	457,473	830,483
1971	-	-	-	-	-	691,013	287,702	403,311	691,013
1972	-	-	-	-	-	689,136	229,278	459,858	689,136
1973	-	-	-	-	-	1,175,333	349,840	825,493	1,175,333
1974	-	-	-	-	-	1,547,821	623,116	924,705	1,547,821
1975	-	-	-	-	-	849,166	456,101	393,065	849,166
1976	2,450	18,964	91	699,741	-	13,104	382,448	351,902	734,350
1977	1,393	18,683	44	606,747	-	8,293	185,898	449,262	635,160
1978	18	13,674	63	406,949	-	5,386	156,916	269,174	426,090
1979	8	11,187	-	309,497	-	543	90,332	230,903	321,235
1980	4,662	22,549	298	499,293	-	24,474	218,269	333,007	551,276
1981	89	8,175	-	458,348	-	-	135,203	331,409	466,612
1982	36	1,685	49	133,923	-	360	39,070	96,983	136,053
1983	-	9,333	91	150,972	3,849	-	64,995	99,250	164,245
1984	440	251,471	-	494,577	36,652	-	292,889	490,251	783,140
1985	-	114,819	-	88,431	18,946	-	41,523	180,673	222,196
1986	-	5,320	-	5,773	18,277	-	7,737	21,633	29,370
1987	-	24,415	-	30,184	3,346	-	6,633	51,312	57,945
1988	-	52,088	-	55,955	7,163	45	11,380	103,871	115,251
1989*	-	-	-	-	-	-	-	-	-
1990	1,207	30,755	170	111,051	25,877	-	95,744	73,316	169,060
1991	-	28,829	-	179,644	8,282	-	125,332	91,423	216,755
1992	-	28,137	-	92,462	6,799	-	64,114	63,284	127,398
1993	-	43,967	-	91,395	7,380	-	63,563	79,179	142,742
1994	-	34,783	-	104,579	10,529	-	65,193	84,698	149,891

\* A moratorium was in effect in 1989

**TABLE 5 continued**

Potomac River Commercial Harvest (lbs) for **STRIPED BASS** by gear type

<u>YEAR</u>	<u>LBS LANDED IN</u>								
	<u>HAUL SEINE</u>	<u>POUND NET</u>	<u>FYKE NET</u>	<u>GILL NET</u>	<u>H &amp; L</u>	<u>MISC.</u>	<u>MARYLAND</u>	<u>VIRGINIA</u>	<u>TOTAL</u>
1995	-	40,018	-	149,663	8,797	-	88,838	109,640	198,478
1996	1,850	48,846	664	284,815	10,365	294	159,402	187,432	346,834
1997	4,446	134,754	2,230	573,014	15,432	1,238	299,995	431,119	731,114
1998	7,185	162,921	1,300	542,798	10,866	1,109	334,349	391,830	726,179
1999	5,623	189,092	1,450	439,093	16,812	1,196	278,646	374,620	653,266
2000	4,110	122,551	2,522	521,216	14,451	1,151	287,828	378,173	666,001
2001	5,460	123,759	2,730	503,693	22,152	882	271,034	387,642	658,676
2002	5,303	140,462	2,728	342,348	27,683	2,524	220,076	300,972	521,048
2003	3,309	141,080	3,245	507,351	20,771	818	364,103	312,471	676,574
2004	8,068	112,414	3,706	622,954	23,484	1,707	406,180	366,153	772,333
2005	5,134	120,460	3,893	381,797	20,228	1,944	243,786	289,670	533,456
2006	5,765	133,959	3,713	493,007	35,674	1,390	324,628	348,880	673,508
2007	6,966	141,835	2,702	412,986	33,408	1,364	291,362	307,899	599,261
2008	6,491	146,146	2,269	415,964	41,596	1,326	327,961	285,831	613,792
2009	3,982	167,711	2,087	501,833	50,785	799	387,291	339,906	727,197
2010	4,019	160,915	2,239	484,545	30,846	676	314,280	368,960	683,240
2011	4,575	152,268	1,731	502,325	32,165	1,087	336,477	357,674	694,151

Figure 1

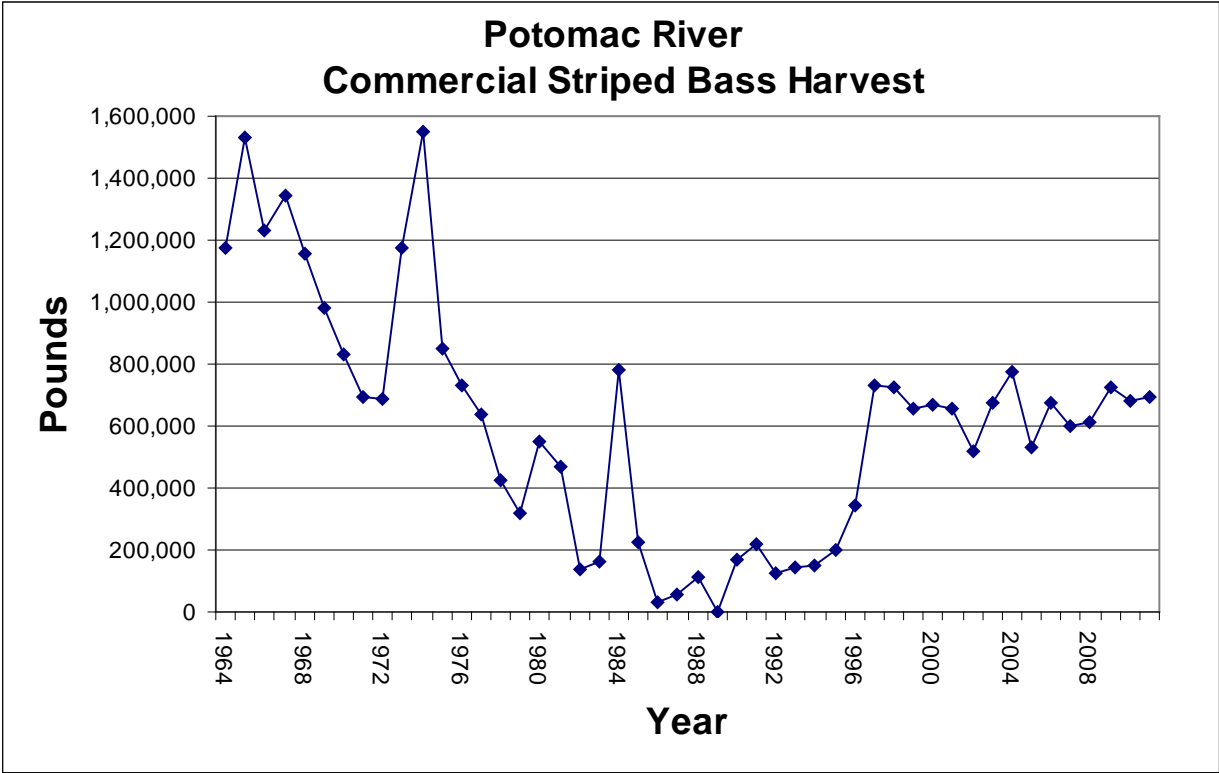
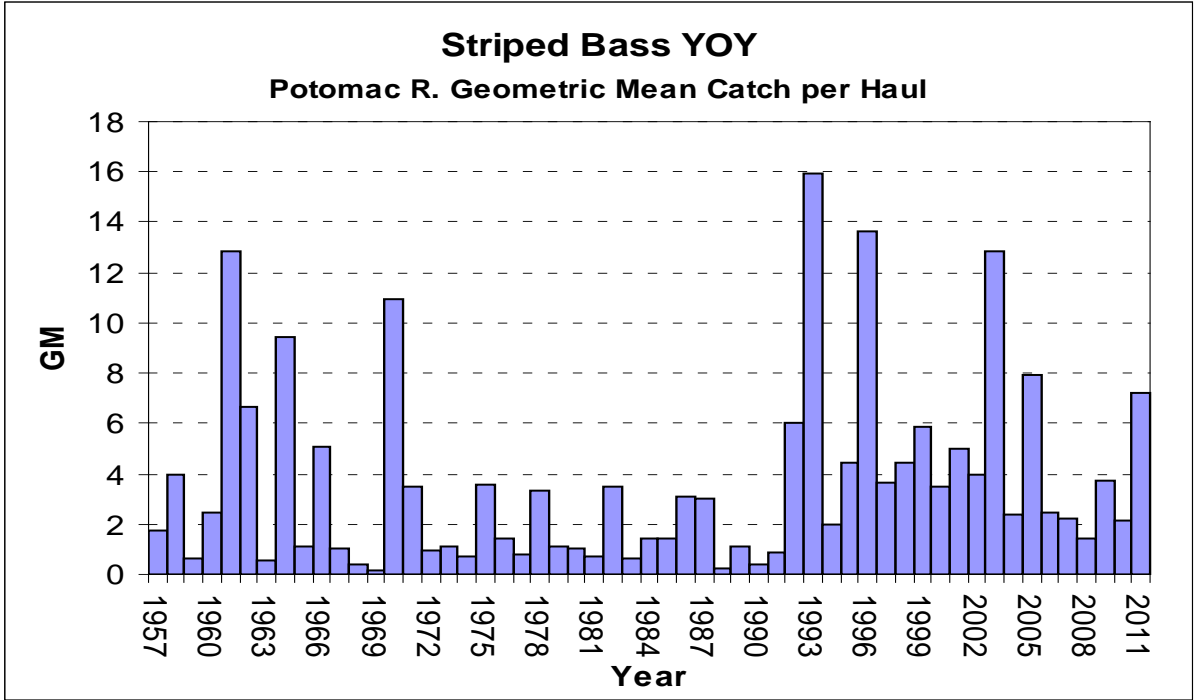


Figure 2



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# Review of Virginia's 2011 Striped Bass Fisheries And Monitoring Programs

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

**June 15, 2012**

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Virginia Marine Resources Commission  
2600 Washington Avenue  
Newport News, Virginia 23607

### **I. Introduction**

The following report describes the 2011 Virginia striped bass fisheries and includes results from fishery dependent and independent monitoring programs. Sources for fishery-dependent data include the VMRC and the Old Dominion University Center for Qualitative Ecology. The Virginia Institute of Marine Science provided the striped bass fishery-independent data. This report also documents the 2011 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 (see attached regulation for a description) and Chesapeake Area harvests of striped bass under a single statewide quota. In May 2002, the Virginia Marine Resources Commission was required by the ASMFC to establish separate quotas for the Chesapeake Area (see attached regulation for a description) and Coastal Area commercial fisheries. The VMRC implemented this two-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 (Chapter) 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 fishery quota was 184,853 pounds in 2011, and is the same for 2012. The 2011 Chesapeake Area commercial and recreational fishery quotas were 1,430,361 pounds each. In 2012, each Chesapeake Area fishery (recreational, commercial) quota is 1,430,361 pounds. Recreational seasons, size limits and possession limits are detailed below.

All data tables that pertain to the derivation of catch-at-age and weight-at-age are contained in the attached main file: VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx. At the request of ASMFC, a separate file with MRIP recreational estimates has been included as VA\_2011\_SB Annual Report Workbook\_MRIP excerpts.xlsx. This file of excerpts only contains the recreational tabs from the main workbook. VA\_Dependent\_2011 contains the support files for the catch-at-age summary table, and VA\_Independent\_2011 contains the research results associated with 2011 Virginia programs.

## **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 2011 Virginia striped bass fisheries are detailed in Virginia Regulation 4 VAC 20-252-10 et seq. The 2011 commercial season for the Chesapeake Area (mainstem Chesapeake Bay, its tributaries and Potomac River tributaries of Virginia) extended from February 1 through December 31, 2011. The commercial season for the Coastal Area extended from February 1 through December 31, 2011. This was the 9th year that separate quotas were used for Coastal Area and Chesapeake Area harvests. The Chesapeake Area quota was 1,430,361 pounds, and the 2011 harvest was 1,275,825 pounds (137,466 fish; average weight 9.28 pounds). The Coastal Area quota was 184,853 pounds, and the 2011 harvest from this area was 158,811 pounds (10,597 fish; average weight 14.99 pounds). The total commercial harvest was 1,434,636 pounds (148,063 fish; grand average weight 9.69 pounds).
  
- Both quotas are managed by an Individual Transferable Quota (ITQ) system. In 2011, as in 2007-2010, the individual shares of quota were in pounds of fish, rather than numbers of fish. From 1998 through 2006, the ITQ share was based on numbers of striped bass. Regulation 4 VAC 20-252-10 et seq. provides all requirements and restrictions associated with the weight-based ITQ systems. 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 2011. Under the ITQ system, any registered commercial fisherman shall not possess more than two 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, 2011.

## (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. In addition, during the month of December, each permitted buyer is required to call the Marine Resources Commission interactive voice recording system on a daily basis to report his striped bass purchases (4 VAC 20-252-130 H. of the attached regulation).

### (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\_Dependent\_2011 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 922 striped bass aged using scales by the Old Dominion University Age and Growth Laboratory (Dr. Hank Liao and Dr. Cynthia Jones), 913 were from commercial fisheries and 9 were from recreational donations. By season and area, 332 and 292 commercial samples were aged from the Chesapeake Area commercial fisheries of spring and fall 2011, respectively. From coastal area commercial fisheries, 285 samples were

aged from spring fisheries and 13 striped bass were aged from fall fisheries. Of the recreational fish aged, all 9 striped bass were from the Chesapeake Area and from the fall.

Of the 922 scale ages, the Old Dominion University Age and Growth Laboratory also processed and read 287 paired otolith samples (which also had a corresponding scale sample) collected by the VMRC (ages extended from 2 to 26 years).

- Commercial catch-at-age matrices are according to a seasonal basis. The recreational catch-at-age (harvest and discard removals) is according to a statewide basis.
- A statewide all-season age-length key, mostly from commercial samples and some recreational samples, was used to calculate a statewide recreational catch-at-age and weight-at-age, and the length-weight parameters used for the recreational fishery spreadsheet were from a combined Bay gill net (spring and fall) regression.
- To characterize the commercial catch-at-age and weight-at-age, Chesapeake Area age-length keys were created from seasonal (January through June and July through December) length and age data, based on combinations of either gill net + hook and line or pound net + haul seine + other minor gear harvested fish. Coastal Area age-length keys were also according to season, with gill net the major contributing gear type, along with a few commercial hook-and-line harvested striped bass. The small subsample of recreationally harvested fish was used in formation of the age-length keys.
- All length-weight equations used in this report are included in the attached file named 2011\_VA\_length\_wt\_regressions.xlsx and can be found below. Catch-at-age files can be found in VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx.
- Harvests (pounds) from minor gear types that were not sampled for biological data were included with the best-fit major gear type to account for the entire harvest, according to area and season, in developing the catch-at-age formats. For example, fyke net was not sampled, and its minor harvest (6,471 pounds) was included with pound

net harvests that were sampled, as was the case with other minor gear types. The file entitled “Commercial harvest\_VA\_2011.xlsx” shows the gear types, by harvest, which comprised area- or season-specific catch-at-age.

Length-weight parameters from 2011 samples of Virginia striped bass commercial fisheries

<i>Area</i>	<i>Season</i>	<i>Gear</i>	<i>Length-weight combinations (N)</i>	<i>Log normal : Length-weight parameters: y-intercept; slope</i>	
Chesapeake	Spring	Gill net	2,156	-7.68348;	2.96343
		Hook and line	88		
		Pound net	146	-8.76203;	3.27467
		Haul seine	0		
	Fall	Gill net	876	-8.00186;	3.03995
		Hook and line	307		
		Pound net	649	-8.84768;	3.28369
		Haul seine	27		
Coastal	Spring	Gill net	302	-6.89195;	2.71199
	Fall	Gill net	201	-5.83317;	2.38551

The majority of striped bass biological samples from Chesapeake Area commercial harvests were taken from gill nets. Gill nets accounted for 86.8% of the Chesapeake Area harvest, and pound nets accounted for 5.7% of the harvest. Haul seine-harvested fish accounted for 0.6% of the Chesapeake Area harvest. All but one of the 315 Coastal Area sampled fish were from gill net harvests, as this gear type accounted for 99.8% of the coastal harvest in 2011. Commercial hook-and-line harvests contributed the remainder of harvest.

Virginia statewide (Chesapeake Area and Coast fisheries, combined) recreational length-weight parameters were based on lengths and corresponding weights from the samples of commercial and recreational striped bass. A statewide approach was used because the ocean area harvest accounted for 7.2% of the statewide harvest in numbers of fish and 11.1% of the statewide harvest, in weight. When the MRFSS estimate of reported landings was used (719,225 pounds), the resulting length-weight



parameters resulted in a spreadsheet-calculated weight-at-age (1,363,739 pounds) that was 89.6% greater than the reported MRFSS landings. When the MRIP estimate of reported landings was used (1,160,914 pounds; see separate workbook, VA\_2011\_SB Annual Report Workbook\_MRIP\_excerpts.xlsx), the spreadsheet-calculated weight-at-age was 1,301,568 pounds, or 12.1% greater than the reported MRIP landings.

Length-weight parameters from 2011 samples of Virginia striped bass recreational fisheries

<i>Area</i>	<i>Season</i>	<i>Gear</i>	<i>Length-weight combinations (N)</i>	<i>Log normal : Length-weight parameters: y-intercept; slope</i>	
Statewide	Waves 2-6	All gears commercial plus recreational hook and line	913 commercial fish; 9 recreational fish	-7.85484;	3.00801
Discards	Waves 2-3 combined and waves 4-6 combined	Waves 2-3: MD VAS;	Waves 2-3: 2,286 fish	-18.27456;	Waves 2-3: 2.97910
		Waves 4-6: MD DNR pound net and VAS	Waves 4-6: 76 fish	-20.48399;	Waves 4-6: 3.30867

(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 4,564 (315 Coastal Area, 4,249 Chesapeake Area) striped bass were measured for length and weight data. Of the samples of size characteristics, gill net harvests accounted for 71.4% (3,032 of 4,249 fish) of the total length sample from the Chesapeake fishery and 99.7% of the Coastal fishery samples of length (N=314). Statewide, gill nets accounted for 73% of the total length sample (as compared to 82% in 2010). A modest sample of recreational fish were sampled for length (N=13) and weight (N=7), with all 13 of the fish from the Chesapeake Area. These data were utilized in age-length keys, along with the commercial samples. Expanded length frequency data can be found in the attached worksheets contained in the VA\_2011\_SB Annual Report

Workbook.xlsx.

(iii) Sex composition

- The VMRC sampling program obtains sex information in two ways: as part of the stratified random (gear, area, time) approach and from fish that are purchased for otolith-scale ageing. The sex composition is more representative than in previous recent years but still biased from collection of partial fishermen harvests. For this reason, sex data for 2011, are not considered representative of the harvest. From Chesapeake Area striped bass fisheries, the program collected 158 males and 104 females. From Coastal Area fisheries, the sex sample consisted of 43 males and 41 females.

(c) Estimation of effort

- At the start of the 2011 season, a total of 414 commercial harvesters were permitted to fish for striped bass in the Chesapeake, and 32 harvesters were permitted for harvest of striped bass from the Coastal Area. 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 total pounds and trips by gear for 2011 are included in the in-text table below.

Coastal System 2011		
Gear	Pounds	Trips
Anchor Gill Net	130,104	227
Drift Gill Net	28,434	65
Hook and Line	273	5
Total	158,811	297
Chesapeake Area System 2011		
Gear	Pounds	Trips
Anchor Gill Net	1,032,938	3,245
Drift Gill net	10,156	42
Stake Gill Net	64,880	307
Fyke net	7,171	70
Hook and Line	79,981	536
Haul Seine	7,698	26
Pound Net	72,973	570
Crab & Fish Pot	26.5	4
Total	1,275,825	4,800

## ii. Recreational Fishery

### (1) Characterization of Recreational fishery\_

- The 2011 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\_2011\_SB Annual Report Workbook\_MRFSS.xlsx. Regulation 4 VAC 20-252-10 et seq., in effect in 2011, is attached to this report. Virginia was allowed a trophy season, as part of a Chesapeake Bay-wide 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 2011 Virginia observed a recreational quota of 1,430,361 pounds for the Chesapeake Bay and its tributaries and Virginia's tributaries of the Potomac River (Chesapeake Area).

### (2) Characterization of directed harvest

#### (a) Landings and method of estimation

- This was the 20<sup>th</sup> consecutive year that the VMRC relied on the NMFS Marine Recreational Fisheries Statistics Survey (MRFSS) for Virginia striped bass harvest and catch estimates, except for trophy-fishery estimates, as

described below. 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 2011 was 26% (statewide recreational harvest, in numbers), using the new MRIP estimation. Recreational landings (weight and number) and discards, for the statewide fishery are listed in the attached EXCEL files: VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx and VA\_2011\_SB Annual Report Workbook\_MRIP excerpts.xlsx. A summary of regulations follows:

<b>Recreational Striped Bass Fisheries, 2011 Regulations</b>					
<b>Area</b>	<b>Season</b>	<b>Size</b>		<b>Possession</b>	
Bay & Coastal Trophy	May 1 - 15	32	Min	1	Fish
Potomac Tribs	Apr 17 - May 15	28	Min	1	Fish
Chesapeake Spring*	May 16 - Jun 15	18	Min	2	Fish
		28	Max		
Chesapeake Fall**	Oct 4 - Dec 31	18	Min	2	Fish
		28	Max		
Potomac Tribs	May 16 - Dec 31	18	Min	2	Fish
		28	Max		
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 18 and 34")					
^1 of the 2-fish limit may be over 28"					

- Sixty-two trophy fish were reported for 2011 from Virginia waters, with all fish but one from the Chesapeake Area. Of the total, 48 reported trophy striped bass were from permitted charter trips, 13 from hook and line fishermen who reported to an on-line journal, and 1 from a recreational fisherman using a paper fishing report form. The VMRC trophy striped bass reporting program was initiated in 1995. The size of harvested fish from charter trips ranged from 32 to 41 inches and all fish (N=48) were kept. Of the 14 fish reported by individual

anglers, the size ranged from 32.5 to 40 inches in total length. 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 142 trophy fish, as compared to 136 trophy fish in 2010. Using an average weight of 15 pounds, the 2011 Chesapeake Area harvest estimate is 2,115 pounds. In almost all years, the largest striped bass reported by MRIP in Wave 3 is generally less than the trophy size for Virginia (32 inches total length after conversion from fork length). In 2011 during Wave 3 MRFSS encountered no trophy-size fish (the largest was 31 inches total length).

(b) Catch composition

(i) Age frequency

- The statewide age-length key consists of 913 commercial length-age combinations and 9 fish donated by recreational harvesters. This age-length key was applied to the distribution of lengths from the MRFSS intercepts, to form the statewide recreational fishery catch-at-age and weight-at-age (see VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx and VA\_2011\_SB Annual Report Workbook\_MRIP excerpts.xlsx). NMFS MRIP was the source for recreational harvest and fork length data for both MRFSS and MRIP workbook treatments. Fork lengths were converted to total lengths, using a regression equation based on all areas, for fish sampled mainly from the commercial fishery or supplied from recreational harvesters (see attached file: Fork\_to\_total\_regression.xlsx).

(ii) Length frequency

- Expanded length frequency distributions can be found in the attached file: VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx.

(iii) Sex (if available)

- From recreational fish donations, eight sample fish were male and one was female.

(c) Estimation of effort

- MRFSS has long been the source for any specific effort trends. MRIP estimates are now available from 2004-2011. The 2011 total general (all-species) trips in Virginia was estimated at 2,751,057 by MRFSS and

2,898,696 using MRIP. The 2010 MRFSS estimate was 2,625,755 general trips, compared to the MRIP estimate of 2,596,891.

**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 1,281 pounds of striped bass in 2011, and this amount is similar to the 1,476 pounds of striped bass confiscated in 2010. 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 2011 confiscations amounted to 272 striped bass.
  - 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 is associated with by-catch mortality, especially in anchor gill net operations. In 2011, most striped bass were caught by gill nets (86.8% of the total Chesapeake Bay Area harvest of 1,275,825 pounds), with roughly 13.2% of the Chesapeake Area quota harvested by other gears such as pound net (5.7%), hook and line (6.3%), and other gear (haul seine, fyke net and pots) accounted for 1.2% of the total harvest in pounds. Of coastal area harvests, gill nets accounted for 99.8% of the 2011 harvest, with commercial hook-and-line harvests contributing the remainder. However, since 2007, the Virginia commercial striped bass fisheries have been managed by an individual weight-based quota, whereby each permitted fisherman is allocated a share of the quota in pounds. This enables fishermen to pick and choose fishing and market opportunities and is expected to lessen by-catch by gill nets considerably, as compared to a less-controlled fishery.
  - 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. According to MRFSS, 178,988 striped bass were released alive (B2s) in 2011 Virginia recreational fisheries (see VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx). This means the estimated hook-and-release mortality (discard losses) estimate is 14,319 striped bass. According to MRIP, 153,581 fish were

released alive in 2011 (see VA\_2011\_SB Annual Report Workbook\_MRIP\_excerpts.xlsx). The estimated discard mortality is 12,286 striped bass.

**iv. Total Harvest & Losses**

<b>Summary of Striped bass losses in Virginia for 2011.</b>			
	<b>Number</b>	<b>Pounds</b>	<b>Average Weight</b>
<b>COMMERCIAL</b>			
Legal Harvest	148,063	1,434,636	9.7
Illegal Harvests (confiscations)	272	1,281	4.7
<b>RECREATIONAL AND CHARTER</b>			
<b>Legal Harvest (all areas):</b>			
Recreational and Charter	128,080 <sup>(1)</sup>	719,225 <sup>(1)</sup>	5.6 <sup>(1)</sup>
	122,241 <sup>(2)</sup>	1,160,914 <sup>(2)</sup>	9.5 <sup>(2)</sup>
Trophy	141	2,115	15
Hook & Release Mortality (8% of all areas B2s)	14,319 <sup>(1)</sup>	57,538 <sup>(1)</sup>	4.0 <sup>(1)</sup>
	12,287 <sup>(2)</sup>	92,873 <sup>(2)</sup>	7.6 <sup>(2)</sup>
<b>MONITORING</b>			
VIMS Samples	1,196	11,130	5.6
VIMS By-catch Mortality, Shad Study	1,335	6,051	4.5
<b>Totals</b>	<b>293,406 <sup>(1)</sup></b>	<b>2,231,976 <sup>(1)</sup></b>	<b>7.6 <sup>(1)</sup></b>
	<b>285,535 <sup>(2)</sup></b>	<b>2,709,000 <sup>(2)</sup></b>	<b>9.5 <sup>(2)</sup></b>

<sup>(1)</sup> MRFSS <sup>(2)</sup> MRIP

**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 (and its tributaries) is attached as a worksheet (VIMS SB Fishery Ind. Juv. Index) in the VA\_2011\_SB Annual Report Workbook.

- (a) Index of abundance (A time series of indices of abundance and associated standard errors of means is contained in the attached worksheet: VIMS SB Fishery Ind. Juv. Index) in the VA\_2011\_SB Annual Report Workbook. This formatted information was requested to facilitate the stock assessment process.

The 2011 striped bass juvenile abundance index is 27.09 and is significantly higher than the newly-estimated historic average of 7.11.

- (b) The standard error of the mean, expressed as a confidence interval =  $\pm 2$  SE is LCI = 22.30, UCI = 32.80.

The complete 2011 annual VIMS report was provided by Mr. Leonard Machut and Dr. Mary Fabrizio and is included in the VA Independent 2011 zip file.

(2) VIMS spring monitoring

A summary of materials and methods associated with the VIMS monitoring studies in the James and Rappahannock rivers is attached. Data from monitoring of gill nets in the James River extends from 1994 through 2011, while data from monitoring of Rappahannock pound nets and gill nets extends from 1991 through 2011. The 2011 results are provided by Mr. Phil Sadler and are included in VA\_2011\_SB Annual Report Workbook\_MRFSS.xlsx, and the entire times series of these monitoring efforts is included in the VA Independent 2011 zip file.

- (a) Mean size (length, weight) data of striped bass sampled by VIMS during spring monitoring studies in the Rappahannock (pound net, multi-mesh gill net) and James (multi-mesh gill net) rivers in 2011 is in an attachment, as part of the VA Independent 2011 zip file. Earlier years' results of these monitoring studies are included.



- (b) A time series of sex ratios, at age, from VIMS spring monitoring programs in the Rappahannock and James rivers, is in the VA Independent 2011 zip file, as VIMS\_sex\_ratio\_1991\_2011.xls.
- (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\_1991-2011.xls.
- (3) Stock Characterization: Not available. Seasonal monitoring and tagging programs may not adequately characterize the stock.
- (4) Tagging  
 (a) In 2011, 3,184 striped bass were tagged from the Rappahannock River as part of the Bay-wide project to enumerate fishing mortality on the stock (see below, for time-series of releases):

Tag release summary

YEAR	Fall releases		Spring releases		ANNUAL TOTAL
	USFWS	VIMS	USFWS	VIMS	
2011	ND	2,498	416	270	3,184
2010	ND	3,019	2,050	232	5,301
2009	ND	3,279	868	347	4,494
2008	ND	2,872	524	169	3,565
2007	ND	1,584	1,961	656	4,201
2006	ND	3,713	668	570	4,951
2005	ND	1,816	921	ND	2,737
2004	3,434	ND	1,655	ND	5,089
2003	3,243	ND	853	ND	4,096
2002	2,895	ND	587	ND	3,482
2001	3,008	ND	976	ND	3,984
2000	3,881	ND	1,773	ND	5,654
1999	3,141	ND	853	ND	3,994
1998	3,601	ND	785	ND	4,386
1997	3,271	ND	724	ND	3,995
1996	1,440	ND	378	ND	1,818
1995	1,953	ND	699	ND	2,652
1994	2,990	ND	195	ND	3,185
1993	2,566	ND	621	ND	3,187
1992	491	ND	1,826	ND	2,317
1991	2,635	ND	5,436	ND	8,071
1990	4,308	ND	2,601	ND	6,909
1989	6,203	ND	4,678	ND	10,881
1988	3,893	ND	4,169	ND	8,062

1987	3,319	ND	1,986	ND	5,305
Subtotals	56,272	18,781	38,203	2,244	115,500

(5) Research Removals

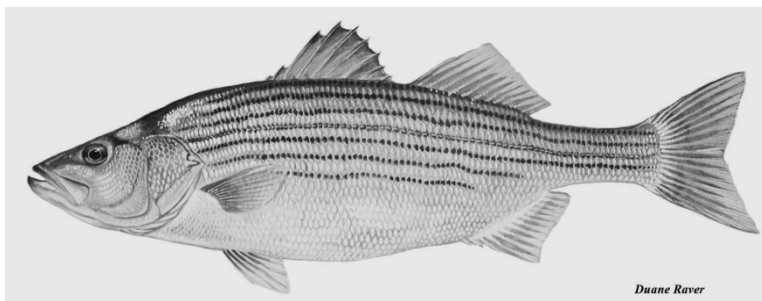
By-catch of striped bass and other species in 2011 (VIMS Programs): A complete report from VIMS: *Monitoring Relative Abundance of American Shad in Virginia Rivers*, is available from Dr. Eric Hilton. Daily numbers and seasonal totals of striped bass and other species captured in staked gill nets can be available, upon request. In addition, other VIMS research removals of striped bass, along with associated mean length and weight data, by age, are included in the VA Independent 2011 zip file.

Throughout the course of monitoring activities in 2011, and including by-catch losses from the American shad staked gill net studies, VIMS removed 1,335 striped bass (6,051 pounds).

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

- A. A copy of current (2012) 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 2011, continue in 2012.

# Review of North Carolina's Striped Bass Fisheries and Monitoring Programs in 2011



Report to the  
Atlantic States Marine Fisheries Commission  
Striped Bass Technical Committee

North Carolina Department of Environment and Natural Resources

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## **I. Introduction**

North Carolina's Atlantic Ocean commercial striped bass quota for 2011 was 480,480 pounds (lbs), while the commercial quota in the Albemarle Sound Management Area (ASMA) was 275,000 lbs. The Atlantic Ocean recreational season was open year round with a 28 inch total length (TL) minimum size limit and a two fish daily creel limit. The ASMA recreational fishery had a quota of 137,500 pounds and was open October 1 through April 30 with an 18 inch TL minimum size limit and a three fish daily creel limit. The Roanoke River Management Area (RRMA) recreational fishery had a quota of 137,500 pounds and was open March 1 through April 30 with an 18 inch TL minimum size limit, a 22-27 inch no possession slot limit, and a two fish daily creel limit with only one of those fish being greater than 27 inches TL.

During 2011 the commercial fisheries harvested 10,701 striped bass that weighed 242,600 pounds in the Atlantic Ocean and 30,696 fish that weighed 134,538 pounds in the ASMA. The recreational fisheries harvested 106,657 fish that weighed 2,125,573 pounds in the Atlantic Ocean, 13,341 fish that weighed 42,536 pounds in the ASMA, and 22,102 fish that weighed 71,561 pounds in the RRMA.

Total losses for 2011 including all discard mortality and research removals were 245,404 fish that weighed 3,217,316 pounds.

## **II. Request for *de minimis***

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

North Carolina has two distinct commercial fisheries that harvest on two distinct stocks. The Atlantic Ocean commercial harvest is comprised of fish predominately from the Atlantic Migratory stock, while the Albemarle Sound Management Area (ASMA) commercial harvest is comprised of fish predominately from the Albemarle Sound/Roanoke River (A/R) stock.

There are often dozens of Proclamations associated with the opening/closing of seasons, changing of daily trip limits, closing of areas to gill netting, mesh size restrictions, summer mandatory gill net attendance, etc. All the regulations are aimed at keeping harvest below the TAC and reducing striped bass discards to the minimum amount possible. Proclamations can be found on the North Carolina Division of Marine Fisheries (NCDMF) website at <http://portal.ncdenr.org/web/mf/proclamations> or will be sent upon request. A list of all proclamations affecting 2011 striped bass fisheries is provided in Appendix A1. The regulations for the 2011 RRMA fishery are in **III.A.ii.(1)RRMA Recreational Fishery**.

#### **Atlantic Ocean Commercial Fishery**

The Atlantic Ocean commercial fishery has operated under a 480,480 pound total allowable catch (TAC) since the 2002/2003 fishing season. The TAC is harvested during a quota season which runs from December 1 through November 30, but for stock assessment purposes only landings for the 2011 calendar year are reported in the accompanying Excel File, SB Annual Report Workbook 2012 NC.xlsx. Season opening and closing dates and daily trip limits may be adjusted to remain below the 480,480 pound TAC. If water temperatures are cold enough, Atlantic Migratory striped bass are present in NC's territorial seas from November through March, so the fishery is prosecuted during these months.

**The beach seine fishery** was open for 87 days with a 28 inch (TL) minimum size limit and a 50 or 150 fish per permit holder trip limit. The TAC allocation to this gear was 160,160 lbs.

**The gill net fishery** was open for 15 days with a 28 inch (TL) minimum size limit and a 10, 15, or 20 fish per permit holder trip limit. The TAC allocation to this gear was 160,160 lbs.

**The trawl fishery** was open for 18 days with a 28 inch (TL) minimum size limit and a 50 or 100 fish per permit holder trip limit. The TAC allocation to this gear was 160,160 lbs.

### **ASMA Commercial Fishery**

The ASMA commercial fishery has operated under a 275,000 lb TAC since 2003. The fishery has a spring season which can operate from January 1 through April 30 and a fall season which can operate from October 1 through December 31. Season opening and closing dates and daily trip limits may be adjusted to remain below the 275,000 pound TAC and to reduce discards. Striped bass were not to exceed 50% of the total poundage of the entire finfish landings, a provision implemented to reduce directed effort towards striped bass yet allow other fisheries to harvest striped bass encountered as bycatch. The primary harvest gear is anchored gill nets during the spring American shad (*Alosa sapidissima*) fishery, but landings also occur from flounder gill nets, pound nets, fyke nets, and small mesh gill nets.

**The spring season** was open from January 1 through April 30, with an 18 inch (TL) minimum size limit and a 7, 10, or 15 fish daily trip limit depending on the other fisheries operating in the ASMA at the time.

**The fall season** was open from October 1 through December 31, with an 18 inch (TL) minimum size limit and a 10 fish daily trip limit.

### (2) Characterization of commercial harvest

#### (a) Landings and method of estimation

##### **Atlantic Ocean Commercial Fishery**

In order to participate in the Atlantic Ocean commercial striped bass fishery, individuals holding a NC Standard Commercial Fishing License (SCFL) had to first obtain a permit declaring which gear type they would be using for the fishing season. Once a gear is declared, the permit holder must use that gear for the next three fishing seasons. Dealers could not possess, buy, sell, or offer for sale, striped bass taken from the Atlantic Ocean without first obtaining a current Atlantic Ocean Commercial Dealer Striped Bass Permit from the NCDMF. Dealer permits were issued only to individuals holding a valid North Carolina finfish dealer's license. Dealers were required to affix either a NCDMF issued striped bass tag or similar tag issued by the state of origin for imported striped bass, through the mouth and gill cover. Dealers were required to report daily landings (numbers of tags used and pounds landed) by noon of the following day to the NCDMF Elizabeth City office to determine closing of the season to remain below the TAC.

During the 2011 calendar year 10,701 fish that weighed 242,600 lbs were harvested (Table 1). The time series for North Carolina's Atlantic Ocean commercial landings are reported in the accompanying Excel File, SB Annual Report Workbook 2012 NC.xlsx.

##### **ASMA Commercial Fishery**

In order to harvest striped bass commercially individuals must hold a NC SCFL. Dealers could not possess, buy, sell or offer for sale, striped bass taken from the ASMA without first obtaining a valid ASMA Dealer's Striped Bass Permit. No dealer could pack or sell striped bass without having affixed either a NCDMF ASMA striped bass tag or a similar tag issued by the state of origin for imported striped bass. Dealers were required to

report daily landings (numbers of tags used and pounds landed) by noon of the following day to the NCDMF Elizabeth City office to determine closing of the season to remain below the TAC.

The 2011 spring ASMA commercial fishery harvested 24,377 fish that weighed 111,241 lbs (Table 2).

The 2011 fall ASMA commercial fishery harvested 6,319 fish that weighed 23,297 lbs (Table 3).

(b) Catch composition

**Atlantic Ocean Commercial Fishery**

Landings were sampled from each gear, either at the fish house as the catch was unloaded, or in situ during the beach seine fishery. There was a target of 600 samples for the season, with samples distributed among gear types based on daily quota monitoring reports by gear. Fish were measured to the nearest mm for fork length (FL) and TL and weighed to the nearest 0.1 kg. Sex was determined using the Sykes (1957) method and scales were obtained from between the dorsal fins for each sample. Numbers of fish per year class were assigned using the following formula:

$$YC_N = L_T \times WTSYC_{S\%} / WTSYC_{SAVG}$$

Where  $YC_N$  is the number of individuals per year class,  $L_T$  is total landings,  $WTSYC_{S\%}$  is the sample percent weight per sex, per year class, and  $WTSYC_{SAVG}$  is the sample average weight per individual, per sex, per year class.

**ASMA Commercial Fishery**

There was a target of 600 samples for the spring season and 300 for the fall season. Landings were sampled weekly at fish houses throughout the ASMA with sampling effort distributed accordingly based on daily quota monitoring reports. All other methods were the same as detailed in III.A.i.(2)(b) Catch composition Atlantic Ocean Commercial Fishery.

(i) Age frequency

There were 390 samples (length, weight, sex, scales) obtained from the Atlantic Ocean commercial harvest (Table 4). The length weight equation ( $y$ -intercept = -7.8645; slope = 3.0429) is provided in the accompanying Excel file Annual Report Workbook 2012 NC.xlsx.

There were 1,002 samples (length, weight, sex, scales) obtained from the ASMA commercial fishery (Table 4). A length weight equation was not generated because removals from the ASMA are not included in the ASMFC coastwide Atlantic migratory stock assessment. Age expansion (catch at age) is provided in Tables 1 – 3. Mean length and weight at age is provided in Tables 5 – 7.

(ii) Length frequency

Length frequency for the Atlantic Ocean sample is provided in Figure 1 and in the accompanying Excel file Annual Report Workbook 2012 NC.xlsx.

Length frequencies for the ASMA spring and fall samples are provided in Figures 2 and 3 and in Table 4.

(iii) Sex

Expanded sex ratios are provided in Tables 1 – 3. Sex ratios were Male:Female 1.00:4.11 for the Atlantic Ocean and Male:Female 1.00:0.85 for the ASMA.

(c) Estimation of effort

Effort and catch cannot be used to estimate overall CPUE by participant, because a trip with zero striped bass catch will not be included in data collected by the NCDMF TTP. In addition, while the Atlantic Ocean is a directed fishery, the ASMA is a bycatch fishery that includes daily trip limits. Furthermore, transfers at sea or at the dock can occur to other permitted SCFL holders. The intent of this is to allow fisherman that catch over their daily landing limit to transfer these fish to other permit holders to reduce regulatory discards.

**ii. Recreational Fishery**

(1) Characterization of the recreational fishery

North Carolina has three distinct recreational fisheries that harvest on two distinct stocks. The Atlantic Ocean recreational harvest is comprised of fish predominately from the Atlantic Migratory stock, while the ASMA and Roanoke River Management Area (RRMA) recreational harvest is comprised of fish predominately from the A/R stock. A list of Proclamations is provided in Appendix A1.

**Atlantic Ocean Recreational Fishery**

North Carolina maintained a 28 in TL minimum size limit with a two fish per person per day creel limit for 2011. The season remained open throughout 2011.

Starting in 2005 and continued annually since, a program was initiated in NC in which anglers were required to report all Atlantic Ocean harvested striped bass from the NC/VA line, south to Ocracoke Inlet, for the months of May through October (Waves 3 – 5). Termed the “catch card survey” the reporting procedure requires that any striped bass harvested recreationally in the designated area must have a landing tag affixed to the fish before it is removed from the vessel. Anglers that harvested striped bass from fishing piers reported their catch at the pier house before leaving the pier. Surf fishermen reported their catch to the nearest reporting station. Reporting stations were established throughout Dare, Currituck, and Hyde counties. Atlantic Ocean striped bass released alive were not required to be reported. The purpose of the program was to obtain more accurate data on striped bass harvested from the Atlantic Ocean during waves 3 – 5.

**ASMA Recreational Fishery**

The ASMA recreational catch is limited by an annual harvest allocation and regulated by size restrictions, creel limits, and seasonal closures. The 2011 harvest allocation of 137,500 lbs was divided between a spring season (January – April) and a fall season (October – December). The 2011 spring and fall seasons operated under a three fish per person per day creel limit. An 18 in TL minimum size limit was in effect for both seasons. Both seasons were open seven days a week.

Striped bass were also harvested using the NCDMF issued Recreational Commercial Gear License (RCGL), which allowed an individual to fish limited amounts of various commercial gears for recreational purposes. RCGL holders were constrained by the same regulations in effect for recreational fishermen and were prohibited from selling their catch. Due to funding cuts there was no harvest estimate for these license holders in 2011. Harvest estimates from 2002 through 2007 averaged ~ 2,000 lbs.

**RRMA Recreational Fishery**

The recreational fishery in the RRMA is regulated through a limited open harvest season, daily possession limits and size limits. For the 2011 season, by rule, the harvest season opened on 1 March and closed on 30 April. The daily possession limit was two fish, the minimum length limit was 18 inches (TL) and a protective slot size limit was in effect that prohibited possession of striped bass between 22 and 27 inches (TL). In addition, only one striped bass greater than 27 inches could be retained in the creel limit. Since 1997, anglers have been required to use only single, barbless hooks in zone 1 from 1 April through 30 June to reduce catch and release mortality.

## (2) Characterization of directed harvest

### (a) Landings and method of estimation

#### **Atlantic Ocean Recreational Fishery**

The Marine Recreational Fishery Statistics Survey (MRFSS), now known as the Marine Recreational Information Program (MRIP) has been conducted annually by the National Marine Fisheries Service (NMFS) in North Carolina since 1979. The survey consists of telephone and on-site angler interviews. The telephone interviews were used to collect data on number of trips, fishing locations, and when the trips were made. Information on actual catch (species, number, weight (0.01 kg), FL, and TL) was collected through on-site angler interviews. The data from both types of interviews were combined to produce estimates of total numbers and pounds of striped bass harvested, and total numbers of striped bass released from North Carolina's territorial seas.

All harvest, release, and length frequency data is obtained from MRIP. Harvest data (Type A + B1) and released alive data (Type B2) were queried By Wave, All Modes, All Ocean. Only information from Waves 1, 2, and 6 were used due to the high PSE often associated with Waves 3, 4, and 5 estimates.

During 2011 the Atlantic Ocean recreational fishery harvested 106,657 fish that weighed 2,125,573 lbs. The MRIP estimates for waves 3-5 were zero. The time series for North Carolina's Atlantic Ocean recreational landings are reported in the accompanying Excel File, SB Annual Report Workbook 2012 NC.xlsx.

There were 7 striped bass that weighed 90 pounds reported as harvested through the catch card survey in 2011. Total length of fish ranged from 29 to 36 inches while weights ranged from 10 to 18 pounds. The 7 fish were harvested in June (N=1), July (N=3), September (N=1), and October (N=2). All fish were self reported.

#### **ASMA Recreational Fishery**

Catch and effort data were collected through on-site interviews at boat ramps during allowed harvest days for each of four ASMA sampling zones. Statistics were calculated through a non-uniform probability access-point creel survey (Pollock et al. 1994). Site probabilities were set in proportion to the likely use of a site according to time of day, day of week, and season. Probabilities for this survey were assigned based on seasonal striped bass fishing pressure observed during past surveys, in addition to anecdotal information of fishing activity for the current year. Probabilities can be adjusted during the survey period according to angler counts to provide more accurate estimates. Morning and afternoon periods were assigned unequal probabilities of conducting interviews, with each period representing half a fishing day. These values varied among sites within zones due to differing fishing pressure. A fishing day was defined as 1.5 hours after sunrise until 1.0 hour after sunset.



Striped bass sampled during the surveys were measured for TL (mm) and weighed to the nearest 0.1 kg. No scales were collected for ageing purposes. Estimations of age composition were based on an age-length key derived from commercial harvest samples.

During 2011 the ASMA recreational fishery harvested 13,341 fish that weighed 42,536 lbs (Table 8). Spring harvest was 19,458 lbs and fall harvest was 23,078 lbs.

### **RRMA Recreational Fishery**

North Carolina Wildlife Resources Commission (NCWRC) personnel used a non-uniform probability stratified access-point creel survey design (Pollock, et al. 1994) to estimate recreational fishing effort, harvest, and numbers of striped bass caught and released from the RRMA for the period 1 March through 30 April 2010.

The survey was stratified by area (zone), time (period), and kind of day (weekdays and weekend days). The upper zone (1) includes the river segment from Roanoke Rapids Lake dam downstream to the U.S. Highway 258 bridge near Scotland Neck. The lower zone (2) extends from U.S. Highway 258 bridge downstream to Albemarle Sound. Because past experience has shown differential catch rates through progression of the open harvest season, the survey was stratified into 2-week sample periods. Within periods, fishing effort and catch is also known to vary as a function of day type so samples and estimates were further stratified by kind of day. Selection of access points where interviews occurred was based upon probability of use data generated from prior creel surveys on the Roanoke River. Probability of fishing activity for time of day (0.4 for AM and 0.6 for PM during periods one and two, and equal probabilities during all other periods) was estimated based upon prior experience with the Roanoke River striped bass fishery.

During 2011 the RRMA recreational fishery harvested 22,102 fish that weighed 71,561 lbs (Table 9).

#### **(b) Catch composition**

##### **(i) Age frequency**

The age frequency for North Carolina's Atlantic Ocean recreational harvest is generated by the ASMFC striped bass stock assessment sub-committee using other state's age length information. Year class composition for the ASMA and RRMA recreational harvests are presented in Tables 8 and 9 respectively.

##### **(ii) Length frequency**

609 length and weight samples were collected from the 2011 Atlantic Ocean recreational striped bass catch. The length frequency is presented in Figure 4 and in the accompanying Excel file Annual Report Workbook 2012 NC.xlsx. The length-weight parameters for the Atlantic Ocean sample were  $y$ -intercept = -6.96669 and slope = 2.752696.

There were 978 length samples collected from the 2011 ASMA recreational catch (Figures 5 and 6) and 679 length samples collected from the RRMA recreational catch (Figure 7). Length-weight parameters were not calculated for the ASMA and RRMA recreational sample as that harvest is not used in the Atlantic Migratory stock assessment.

##### **(iii) Sex**

Sex information is not collected from the Atlantic Ocean or ASMA recreational catches. Sex ratio from the RRMA recreational catch sample was Male:Female 1.00:0.66. Sex expansion to the total RRMA harvest is presented in Table 9.

(c) Estimation of effort

There were 85,941 angler trips targeting striped bass in the Atlantic Ocean in 2011. In the ASMA there were 13,114 vessel trips (85,325 angler hours) for striped bass, and in the RRMA there were 27,311 angler trips (122,876 angler hours) for striped bass (Table 10).

**iii. Other Losses (poaching, hook & release Mortality, bycatch, etc.)**

The available data to estimate losses from poaching is limited. In 2011 Marine Patrol confiscated 170 striped bass that weighed 1,723 lbs.

Hook and release mortality in the Atlantic Ocean fishery is calculated by applying 8% release mortality to all estimated releases. Hook and release mortality in the ASMA and RRMA is calculated by applying 6.4% release mortality (Nelson 1998) to all releases. The MRFSS estimates 296,306 fish released alive in the Atlantic Ocean during 2011, resulting in 23,705 additional losses. Applying the average weight of the sampled catch (21.8 lbs) equals 516,769 lbs lost. There were an estimated 8,274 dead discards equaling 25,621 lbs in the ASMA and RRMA recreational fisheries in 2011.

Bycatch losses for the ASMA commercial gill net fisheries were estimated by determining four things: 1) total gill net trips by gill net category (categories are small mesh net trips, flounder net trips, and shad net trips), 2) average yards of gill net set per trip, 3) striped bass catch rates, and 4) striped bass at net mortality rates (no estimates of delayed mortality are available).

The number of striped bass discard losses at age was estimated from the IGNS data. Numbers of discards by mesh size (large vs. other/small) were proportioned into year classes based on the composition of year classes in the 3.0 and 3.5 ISM and the 5.5 ISM nets respectively from the IGNS. The numbers were then converted into pounds based on the mean weight at age for a particular year class.

For any given category, once the number of trips, yards per trip, striped bass catch rates (# striped bass per yard of gill net), and striped bass at net mortality rates were determined; striped bass bycatch losses were calculated using the following formula:

$$B^L = [ T^{\#} \times Y^{\#} \times B^{stb} \times M ] - H$$

where  $B^L$  = bycatch losses,  $T^{\#}$  = total number of gill net trips,  $Y^{\#}$  = yards per trip,  $B^{stb}$  = bycatch of striped bass per yard of gill net,  $M$  = discard mortality, and  $H$  = harvest.

Bycatch losses for the ASMA commercial gill net fisheries were estimated at 26,836 fish (52,433 lbs), and were attributed predominately to the small mesh gill net fishery (Table 11). The majority of the discards were undersize occurring in the small mesh fisheries and from the 2008 and 2009 year classes.

**iv. Total Harvest & Losses**

Total losses are summarized in Table 12.

**B. Fishery Independent Monitoring Programs**

North Carolina is required through Amendment 6 to the ASMFC Interstate FMP for Atlantic Striped Bass to conduct a juvenile abundance survey in the Albemarle Sound and a spawning stock survey in the Albemarle Sound and Roanoke River for the A/R stock. Results from the required independent monitoring programs are detailed in the text, however spreadsheets of length frequency, age length keys, etc are not provided as the results are not used in the coastwide Atlantic migratory striped bass stock assessment.

### **i. Results**

(1) Juvenile Abundance Survey: The NCDMF juvenile abundance survey has 7 fixed stations in western Albemarle Sound, the primary nursery area for A/R juvenile striped bass. Stations are sampled bi weekly from mid July through October for a total of 56 samples. Tow times are 15 minutes using a semi-balloon trawl with an 18 ft head rope, constructed of 1½ in stretched mesh webbing in the body and ½ inch stretched mesh webbing in the cod end. The results from the survey comprise the A/R JAI. Catch per unit effort is calculated as the arithmetic mean of number of striped bass per tow for comparison to the long-term data series and as geometric mean for NC stock assessment purposes.

A total of 845 YOY striped bass was collected in 56 trawls, for a JAI of 15.1, nearly double the long-term average of 8.5 (Table 13: Figure 8). Striped bass were collected during each sampling week, and there were only 3 tows with zero catch. Total length ranged from 41 to 130 mm and the mean TL increased an average of 3.0 mm per week, from 58 mm on 13 July to 101 mm on 18 October (Table 14).

(2) Spawning stock assessments and stock characterization: North Carolina annually conducts two spawning stock surveys on the A/R stock. One survey is conducted by the NCDMF using gill net and the other is conducted by the NCWRC using electrofishing gear.

North Carolina also participates in an annual cooperative effort to tag and assess the age composition of the Atlantic migratory stock over wintering off southern VA and/or northern NC. The survey has been conducted annually since the winter of 1988. This survey is conducted through joint efforts of the National Marine Fisheries service (NMFS), Maryland Department of Natural Resources (MDNR), US Fish and Wildlife Service (USFWS), and NCDMF, utilizing National Oceanic and Atmospheric Administration (NOAA) vessels and trawl gear. The majority of the striped bass captured were measured and tagged with USFWS internal anchor tags. Scales for ageing and TL mm were obtained from a representative portion of the oceanic migratory striped bass captured during the survey. Scales were processed as described in earlier sections. All readable scales collected from the COOP Survey were aged. However, due to funding cuts, the survey platform changed and used charter boats in the Atlantic Ocean striped bass fishery to catch striped bass by hook and line for tagging purposes.

Independent Gill Net Survey: The stratified-random multiple-mesh Independent Gill Net Survey (IGNS) began in 1990 to monitor the striped bass resident and overwintering fall/winter population in the Albemarle and Croatan Sounds and the A/R striped bass spring spawning population. The 12 different mesh sizes used allow capture of fish age one and older. Only results from the spring spawning survey which is concentrated around the mouth of the Roanoke River are reported here. An in-depth methodology is available by request.

A total of 1,721 striped bass were collected in 1,447 units of effort for a CPUE of 1.19, the second largest CPUE in the 21 year survey (Table 15). Year class composition, age expansion, and sex ratio are provided in Table 16. The length frequency graph is provided in Figure 9.

**DEVIATIONS:** None.

- Electrofishing Survey: NCWRC personnel sampled striped bass weekly from 5 April through 18 May with a boat-mounted electrofishing unit (Smith-Root 7.5 GPP; 1 netter and 1 boat operator) during daylight hours in the vicinity of Gaston (rm 135) and Weldon (rm 129), the historical spawning area for Roanoke River striped bass. Relative abundance of striped bass for each sample was indexed by catch-per unit-effort (CPUE) and expressed as number of fish captured per hour (fish/h). Overall pooled CPUE ( $\Sigma$  fish collected/ $\Sigma$  hours of electrofishing effort) for all 2011 sample sites and daily pooled CPUE were calculated.

Weekly electrofishing sampling in the Roanoke River between 11 April and 23 May 2011 yielded 3,061 striped bass. Sixty-eight of the 3,061 striped bass were collected from separate broodstock sampling sites and were removed from relative abundance calculations. Sex ratio was Male:Female 2,358:679 Overall relative abundance of striped bass for 2011 was 166.2 fish/h (Tables 17 and 18; Figure 10). Year class composition, mean length, and mean weight at age are presented in Table 19. The length frequency is presented in Figure 11.

North Carolina Cooperative Winter Tagging Cruise: During the 2011 Cooperative Tagging Cruise, TL and age samples were taken from 107 striped bass. The 1997-2005 year classes were represented in the sample. The 2002-2004 year classes comprised 89% of the sample, with the 2003 year class making up 46% of the sample (Table 20). Fish ranged from 26 to 43 inches (Figure 12).

(3) Tagging: The NCDMF has tagged striped bass since 1980. Currently tags are manufactured by Floy (FM-84) with a tube length of 90 mm and anchor disc dimensions of 5 mm x 15 mm. Tags were inserted in the abdominal cavity on the left side posterior to the pectoral fin.

During the 2010/2011 fall/winter IGNS, 2011 spring spawning stock IGNS, and the 2011 electrofishing spawning stock survey, 748, 525, and 2,693 striped bass were tagged respectively. A complete tagging report is available upon request.

(4) Research Removals: There were 2,872 striped bass that weighed 3,578 lbs sacrificed for research purposes in 2011 (Table 12). Unless spoiled, all sacrificed striped bass from the IGNS were donated to the local food bank.

**IV. Planned management programs for the current calendar year.**  
**A. Summarize regulations that will be in effect.**

Regulations for the 2012 season will remain unchanged.

**B. Summarize monitoring programs that will be performed.**

The NCDMF and NCWRC will perform the same monitoring programs as outlined in Amendment 6: Catch composition of the commercial and recreational fisheries, juvenile abundance surveys, spawning stock surveys, and tagging programs.

**C. Highlight any changes from the previous year.**

None.

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Table 1. Estimated number of striped bass by year class and sex harvested from the Atlantic Ocean commercial fisheries, NC, 2011 calendar year. Percent composition is by number.

Year Class	Male			Female			Totals		
	N	LBS	% Comp	N	LBS	% Comp	N	LBS	% Comp
2005	476	4,866	4.4	571	7,158	5.3	1,046	12,024	9.78
2004	428	6,087	4.0	476	6,915	4.4	904	13,002	8.44
2003	666	12,325	6.2	2,283	43,461	21.3	2,949	55,787	27.56
2002	285	7,067	2.7	1,760	38,832	16.4	2,045	45,899	19.11
2001	190	4,351	1.8	1,902	52,798	17.8	2,093	57,150	19.56
2000	48	1,416	0.4	523	15,922	4.9	571	17,337	5.33
1999			0.0	476	16,457	4.4	476	16,457	4.44
1998				190	7,303	1.8	190	7,303	1.78
1997				143	5,631	1.3	143	5,631	1.33
1996				190	7,911	1.8	190	7,911	1.78
1995				48	1,782	0.4	48	1,782	0.44
1994				48	2,317	0.4	48	2,317	0.44
Totals	2,093	36,112	19.6	8,608	206,488	80.4	10,701	242,600	100.00

Note. Table may not add due to rounding.

Table 2. Estimated number of striped bass by year class and sex harvested during the spring commercial harvest, Albemarle Sound Management Area, NC 2011. Percent composition is by number.

Year Class	Male			Female			Totals		
	N	LBS	% Comp (N)	N	LBS	% Comp (N)	N	LBS	% Comp (N)
2007	6,173	22,217	25.3	4,160	15,990	19.5	10,332	38,207	48.4
2006	6,173	26,656	25.3	4,875	23,005	22.8	11,048	49,661	51.7
2005	850	4,713	3.5	850	5,076	4.0	1,700	9,789	8.0
2004	313	2,435	1.3	313	2,381	1.5	626	4,816	2.9
2003	268	2,754	1.1	89	773	0.4	358	3,527	1.7
2002	45	779	0.2	89	1,021	0.4	134	1,800	0.6
2001	45	907	0.2	89	1,657	0.4	134	2,564	0.6
2000				45	878	0.2	45	878	0.2
Totals	13,866	60,461	56.9	10,511	49,903	43.1	24,377	111,241	100.0

Note. Table may not add due to rounding.

Table 3. Estimated number of striped bass by year class and sex harvested during the fall commercial harvest, Albemarle Sound Management Area, NC 2011. Percent composition is by number.

Year Class	Male			Female			Totals		
	N	LBS	% Comp (N)	N	LBS	% Comp (N)	N	LBS	% Comp (N)
2008	1,093	2,739	17.3	605	1,519	9.6	1,698	4,258	26.9
2007	694	2,175	11.0	1,211	3,846	19.2	1,905	6,021	30.1
2006	428	1,533	6.8	694	2,703	11.0	1,122	4,236	17.8
2005	295	1,385	4.7	650	2,995	10.3	945	4,380	15.0
2004	192	1,153	3.0	310	1,879	4.9	502	3,032	7.9
2003	15	130	0.2	74	621	1.2	89	751	1.4
2002				30	298	0.5	30	298	0.5
2001	15	169	0.2	15	153	0.2	30	322	0.5
Totals	2,731	9,284	43.2	3,588	14,013	56.8	6,319	23,297	100.0

Note. Table may not add due to rounding.

Table 4. Summary of 2011 North Carolina commercial striped bass sampling from the Atlantic Ocean and Albemarle Sound Management Area.

Fishery	Length Frequency Sample Size	# Age Samples in Age Length Key
Atlantic Ocean Trawl	163	93
Atlantic Ocean Gill Net	227	128
ASMA Gill Net	783	302
ASMA Pound Net	219	83

Table 5. Year class composition, total length (mm) and weight (kg) data for striped bass sampled from the Atlantic Ocean commercial harvest, NC 2011 calendar year. Length and weight data are for aged fish only. Standard deviations are listed in parentheses.

Year Class	N Aged	Total Length (mm)			Weight (kg)		
		Mean	Min	Max	Mean	Min	Max
2005	22	786 (35)	711	832	5.2 (1.5)	3.0	7.5
2004	19	825 (21)	790	867	6.5 (1.3)	3.8	8.3
2003	62	903 (29)	854	952	8.6 (1.2)	6.0	11.0
2002	43	963 (33)	896	1,078	10.2 (1.6)	7.2	15.3
2001	45	1,007 (37)	922	1,091	12.4 (1.6)	9.3	16.3
2000	12	1,043 (21)	1,010	1,068	13.8 (1.0)	12.0	15.0
1999	10	1,086 (12)	1,060	1,104	15.7 (1.5)	12.9	18.1
1998	4	1,116 (12)	1,101	1,129	17.4 (1.0)	16.0	18.3
1997	3	1,121 (12)	1,108	1,131	17.9 (2.8)	14.7	19.8
1996	4	1,152 (14)	1,132	1,166	18.9 (2.7)	15.3	21.7
1995	1	1,187			17.0		
1994	1	1,229			22.1		
Totals	226						

Table 6. Year class composition, total length (mm) and weight (kg) data for striped bass sampled from the Albemarle Sound Management Area spring commercial harvest, NC 2011. Length and weight data are for aged fish only. Standard deviations are listed in parentheses.

Year Class	N Aged	Total Length (mm)			Weight (kg)		
		Mean	Min	Max	Mean	Min	Max
<u>Male</u>							
2007	41	491 (25)	451	553	1.48 (0.24)	1.05	1.94
2006	32	546 (27)	495	617	2.10 (0.22)	1.61	2.58
2005	15	604 (29)	564	660	2.59 (0.29)	2.20	3.18
2004	7	677 (64)	592	768	3.53 (0.69)	2.81	4.70
2003	6	730 (57)	647	811	4.66 (1.33)	3.20	6.75
2002	1	870	870	870	7.90		
2001	1	905	905	905	9.20		
<u>Female</u>							
2007	40	511 (27)	465	566	1.59 (0.28)	1.03	2.05
2006	38	567 (29)	490	618	2.29 (0.32)	1.53	2.97
2005	11	606 (20)	580	642	2.86 (0.19)	2.63	3.20
2004	7	671 (39)	632	746	3.45 (0.34)	2.86	4.00
2003	2	723 (61)	662	784	3.92 (0.40)	3.64	4.20
2002	2	816 (14)	802	829	5.18 (0.11)	5.10	5.25
2001	2	902 (17)	885	919	8.40 (1.41)	7.40	9.40
2000	1	997	997	997	8.90		
Totals	206						

Table 7. Year class composition, total length (mm) and weight (kg) data for striped bass sampled from the Albemarle Sound Management Area fall commercial harvest, NC 2011. Length and weight data are for aged fish only. Standard deviations are listed in parentheses.

Year Class	N Aged	Total Length (mm)			Weight (kg)		
		Mean	Min	Max	Mean	Min	Max
<u>Male</u>							
2008	34	483 (17)	456	514	1.1 (0.2)	0.8	1.5
2007	20	523 (17)	491	551	1.5 (0.2)	1.2	1.9
2006	16	546 (20)	523	596	1.6 (0.2)	1.4	2.3
2005	20	590 (26)	551	650	2.1 (0.5)	1.5	3.3
2004	13	633 (35)	577	695	2.7 (0.4)	2.2	3.8
2003	1	708			4.0		
2001	1	886			5.2		
<u>Female</u>							
2008	22	484 (11)	468	512	1.1 (0.2)	0.8	1.6
2007	25	527 (20)	492	565	1.5 (0.2)	1.1	2.1
2006	18	566 (29)	540	661	1.9 (0.4)	1.6	2.7
2005	26	593 (24)	529	626	2.2 (0.4)	1.4	2.9
2004	19	640 (29)	594	691	2.8 (0.4)	1.8	3.5
2003	4	669 (38)	628	704	3.6 (1.0)	2.7	4.8
2002	2	761 (1)	760	761	4.6 (0.0)	4.6	4.6
2001	1	727			4.7		
<u>Totals</u>							

Note. Table may not add due to rounding.

Table 8. Estimated number of striped bass harvested during the 2011 Albemarle Sound Management Area spring and fall recreational fishery.

Year class	Percent contribution	N
<u>Spring</u>		
2008	27.2	1,588
2007	38.2	2,232
2006	18.6	1,085
2005	10.9	636
2004	4.7	274
2003	0.5	30
Total	100.0	5,845
<u>Fall</u>		
2008	57.9	4,340
2007	22.8	1,707
2006	9.1	679
2005	4.8	359
2004	1.1	82
2003	1.1	82
2002	1.1	82
2001	1.1	82
2000	1.1	82
Total	100.0	7,496

Table 9. Estimated number of striped bass harvested during the 2011 Roanoke River Management Area recreational fishery. N represents the actual number of striped bass measured in the creel survey.

Sex and Year Class	Age	N	Percent Composition	Estimated Number in Recreational Harvest
Males				
2008	3	160	39.0%	5,208
2007	4	130	31.7%	4,232
2006	5	31	7.6%	1,009
2005	6	86	21.0%	2,799
2004	7	1	0.2%	33
2003	8	0	0.0%	0
2002	9	2	0.5%	65
	Total	410	100.0%	13,346
Females				
2008	3	109	40.5%	3,548
2007	4	81	30.1%	2,637
2006	5	52	19.3%	1,693
2005	6	21	7.8%	684
2004	7	5	1.9%	163
2003	8	0	0.0%	0
2002	9	1	0.4%	33
	Total	269	100.0%	8,756

Table 10. Estimated recreational effort for striped bass in North Carolina, 2011.

Fishery	Trips	Angler hours
Atlantic Ocean	85,941	N/A
Albemarle Sound Management Area spring	6,906	45,042
Albemarle Sound Management Area fall	6,208	40,283
Roanoke River Management Area	27,311	122,876
Totals		

Table 11. Estimated discard mortality attributed to the Albemarle Sound Management Area commercial gill net fisheries in 2011.

Fishery	Year Class	N	Pounds
<b>Flounder</b>			
	2008	189	408
	2007	431	1,429
	2006	946	3,878
	2005	761	3,674
	2004	0	2,653
<b>Total</b>		<b>2,326</b>	<b>12,042</b>
<b>Shad</b>			
	2008	131	282
	2007	298	988
	2006	654	2,682
	2005	526	2,541
	2004	0	1,835
<b>Total</b>		<b>1,609</b>	<b>8,328</b>
<b>Small/other</b>			
	2010	142	44
	2009	16,570	18,266
	2008	5,859	12,659
	2007	330	1,095
	2006	75	307
<b>Total</b>		<b>22,901</b>	<b>32,063</b>
<b>Grand Total</b>		<b>26,836</b>	<b>52,433</b>

Table 12. Total striped bass losses for North Carolina (Atlantic Ocean, Albemarle Sound Management Area, and Roanoke River Management Area), in 2011.

<b>Fishery</b>	<b>Area</b>	<b>N</b>	<b>LBS</b>
<b><u>Commercial</u></b>			
	<b><u>ASMA</u></b>		
	harvest	30,696	134,538
	bycatch mortality	26,836	52,433
	<b><u>Atlantic Ocean</u></b>		
	harvest 2011 cal year	10,701	242,600
	bycatch mortality	no	estimate
<b><u>Recreational</u></b>			
	<b><u>ASMA</u></b>		
	harvest	13,341	42,536
	discard mortality	1,380	2,870
	<b><u>RRMA</u></b>		
	harvest	22,102	71,561
	discard mortality	6,894	22,751
	<b><u>Atlantic Ocean</u></b>		
	harvest	106,657	2,125,573
	discard mortality	23,705	516,769
<b><u>Research</u></b>			
	<b><u>ASMA</u></b>		
	Independent Gill Net Survey	2,872	3,578
	<b><u>RRMA</u></b>		
		0	0
<b><u>Confiscations</u></b>			
	<b><u>ASMA</u></b>		
		170	1,723
<b><u>Aquaculture</u></b>			
	<b><u>ASMA</u></b>		
		0	0
	<b><u>RRMA</u></b>		
		0	0
<b><u>Broodstock</u></b>			
	<b><u>ASMA</u></b>		
		0	0
	<b><u>RRMA</u></b>		
		50	384
<b><u>RCGL</u></b>			
	<b><u>ASMA</u></b>		
		no	estimate
<b>TOTALS</b>		245,404	3,217,316

Table 13. Juvenile Abundance Index (JAI) for A/R striped bass young-of-year trawl sampling in western Albemarle Sound NC 1955-2011

Year	Western Albemarle Sound Trawls	
	Arithmetic Mean	Geometric Mean
1955	3.3	
1956	19.1	
1957	5.7	
1958	0.2	
1959	23.9	
1960	5.9	
1961	10.3	
1962	7.9	
1963	4.8	
1964	3.1	
1965	10.1	
1966	3.5	
1967	23.4	
1968	6.6	
1969	3.0	
1970	12.5	
1971	2.9	
1972	2.5	
1973	2.0	
1974	5.5	
1975	10.8	
1976	10.5	
1977	3.6	
1978	0.6	
1979	0.6	
1980	0.5	
1981	0.1	
1982	3.8	0.5
1983	0.8	0.4
1984	0.4	0.1
1985	1.2	0.1
1986	0.1	0.1
1987	0.1	0.2
1988	4.1	1.3
1989	4.3	2.0
1990	1.4	0.6
1991	0.9	0.4
1992	2.6	0.7
1993	44.5	17.3
1994	38.2	14.9
1995	9.9	3.1
1996	31.5	9.8
1997	5.4	1.7
1998	7.0	2.8
1999	0.8	0.5
2000	58.8	20.0
2001	3.3	1.3
2002	7.3	2.1
2003	0.3	0.2
2004	1.7	0.8
2005	34.6	9.5
2006	3.0	1.4
2007	7.2	2.3
2008	6.6	1.4
2009	0.4	0.2
2010	8.9	3.9
2011	15.1	7.6
Mean	8.5	3.6



Table 14. Number, mean TL (mm), and range TL (mm) of striped bass young-of-year collected during bi-weekly trawls in western Albemarle Sound, NC, 2011.

Year 2011		Date							
Calendar Week	28	30	32	34	36	38	40	42	
Station	13 Jul	27 Jul	10 Aug	23 Aug	7,8 Sept	19 Sept	3 Oct	18 Oct	Totals
Brickhouse (149)	3	27	29	8	126	1	30	11	235
Nixons Beach (137)	26	8	0	17	6	30	2	42	131
Georges Beach (150)	12	12	5	6	2	8	8	1	54
Batemans Beach (151)	2	3	4	12	12	55	8	6	102
Albemarle Beach (152)	11	2	1	0	6	8	2	5	35
Black Walnut Point (139)	1	10	21	5	1	0	4	15	57
Cape Colony (153)	28	67	15	13	68	12	27	1	231
Totals	83	129	75	61	221	114	81	81	845
Mean TL mm	58	70	75	89	85	94	94	101	83
Range TL mm	41-75	54-100	59-115	71-120	65-110	73-130	76-127	82-119	41-130
CPUE	11.9	18.4	10.7	8.7	31.6	16.3	11.6	11.6	15.1

Long term average = 8.5

Table 15. Catch per unit effort (CPUE) from the spring spawning stock Independent Gill Net Survey, conducted in the western Albemarle Sound, NC, 1990-2011.

Spring Segment	Effort	N	CPUE
1991	1,964	2,084	1.06
1992	2,330	1,091	0.47
1993	2,230	614	0.28
1994	2,032	413	0.20
1995	1,950	1,989	1.02
1996	1,883	1,227	0.65
1997	1,925	1,707	0.89
1998	1,909	1,961	1.03
1999	1,991	2,302	1.16
2000	2,011	1,829	0.91
2001	1,867	1,789	0.96
2002	1,850	1,623	0.88
2003	2,166	884	0.41
2004	1,948	1,886	0.97
2005	1,964	1,451	0.74
2006	1,934	1,906	0.99
2007	1,923	973	0.51
2008	1,801	2,417	1.34
2009	1,559	1,204	0.77
2010	1,362	1,415	1.04
2011	1,447	1,721	1.19
	1,907	1,547	0.83

Table 16. Year class composition, total length (mm), and weight (kg) data taken from a subsample of striped bass collected during the spring Independent Gill Net Survey conducted in the western Albemarle Sound, NC, 2011. Length and weight data are for aged fish only. Standard deviations are listed in parentheses.

Year Class	N Aged	N Expanded	N Total	% Comp	Total Length (mm)			Weight (kg)		
					Mean	Min	Max	Mean	Min	Max
<u>Male</u>										
2009	47	121	168	9.8	363 (25)	274	408	0.51 (0.10)	0.19	0.77
2008	45	265	310	18.1	443 (25)	385	485	1.00 (0.24)	0.62	1.59
2007	17	47	64	3.7	499 (27)	458	552	1.52 (0.33)	1.11	2.30
2006	17	29	46	2.7	531 (30)	485	584	1.73 (0.22)	1.29	2.15
2005	11	19	30	1.7	561 (37)	520	622	2.13 (0.30)	1.86	2.76
2004	9	5	14	0.8	633 (93)	557	787	3.08 (1.12)	2.23	5.10
2003	1	0	1	0.1	731					
<u>Female</u>										
2010	1	0	1	0.1	204			0.14		
2009	61	177	238	13.9	354 (34)	258	414	0.49 (0.14)	0.16	0.83
2008	46	262	308	18.0	445 (25)	390	504	0.96 (0.18)	0.65	1.33
2007	25	52	77	4.5	507 (23)	463	558	1.49 (0.23)	1.00	1.83
2006	10	10	20	1.2	550 (19)	520	569	1.99 (0.16)	1.84	2.27
2005	11	8	19	1.1	569 (32)	528	650	2.25 (0.50)	1.75	3.59
2004	10	3	13	0.8	620 (59)	528	726	3.04 (1.23)	1.48	5.30
2003	3	0	3	0.2	682 (95)	610	790	2.94		
2000	2	0	2	0.1	932 (7)	927	937	10.10 (1.27)	9.20	11.00
<u>Unknown</u>										
2009	8	104	112	6.5	292 (36)	251	346	0.46	0.46	0.46
2008	0	199	199	11.6						
2007	0	60	60	3.5						
2006	2	17	19	1.1	590 (1)	589	590			
2005	3	4	7	0.4	604 (47)	556	650			
2004	0	4	4	0.2						
<u>Totals</u>	329	1,386	1,715	100.0						

Note: Table may not add due to rounding

Table 17. Daily pooled CPUE (daily catch/daily effort) of striped bass collected by electrofishing on the Roanoke River spawning grounds during 2011. A total of eight sites were sampled during each sampling date. Mean daily discharge from the US Geological Survey gauging station at Roanoke Rapids, NC and mean daily water temperature from field collections are also provided.

Date	Effort (h)	Catch	Pooled CPUE	Discharge (cfs)	Water Temp (°C)
11 April	2.41	133	55.31	6,370	14.1
18 April	2.60	254	97.63	8,390	16.0
25 April	2.70	750	277.58	11,300	18.4
2 May	2.49	494	198.73	7,190	20.1
9 May	2.41	646	267.86	9,640	20.6
16 May	2.88	589	204.55	6,300	20.8
23 May	2.52	127	50.40	5,140	22.6

Table 18. Year class composition and relative abundance (CPUE; fish/h) of striped bass collected by electrofishing on the Roanoke River spawning grounds, 2011.

Year Class	Age	Percent Composition				CPUE (fish/h)			
		Male	Female	Unknown	Overall	Male	Female	Unknown	Overall
2010	1			0.6	0.6			1.1	1.1
2009	2	11.8	0.6	0.1	12.5	19.2	1.0	0.1	20.3
2008	3	35.7	7.8		43.5	58.0	12.7		70.7
2007	4	13.9	3.2		17.0	22.6	5.1		27.7
2006	5	3.5	2.5		6.0	5.7	4.1		9.8
2005	6	10.1	3.9		14.0	16.5	6.3		22.8
2004	7	1.2	2.1		3.4	2.0	3.5		5.5
2003	8	0.2	0.2		0.4	0.4	0.3		0.7
2002	9	0.2	0.1		0.2	0.3	0.1		0.4
2001	10	0.3	0.3		0.5	0.4	0.4		0.8
2000	11	0.1	0.2		0.4	0.2	0.4		0.6
1999	12	0.0	0.3		0.4	0.1	0.5		0.6
1998	13		0.2		0.2		0.3		0.3
1997	14	0.1	0.3		0.4	0.1	0.5		0.6
1996	15		0.4		0.4		0.6		0.6
1995	16		0.1		0.1		0.1		0.1
Totals		77.1	22.2	0.7	100.0	125.5	35.9	1.2	162.6

Table 19. Age composition, mean total length (mm), and mean weight (kg) of striped bass collected by electrofishing on the Roanoke River spawning grounds, 2011. Mean lengths and weights were calculated from the ageing subsample. Standard deviations are in parentheses.

Year Class	N Aged	N Expanded	N Total	% Comp	Total Length (mm)			Weight (kg)		
					Mean	Min	Max	Mean	Min	Max
<u>Male</u>										
2009	41	318	359	15.3	417 (21)	320	441	0.6 (0.2)	0.3	1.0
2008	42	1,044	1,086	46.3	453 (21)	420	502	1.0 (0.2)	0.6	1.5
2007	23	399	422	18.0	492 (27)	450	600	1.4 (0.3)	1.0	2.3
2006	11	96	107	4.6	519 (32)	498	648	1.9 (0.4)	1.4	3.0
2005	36	272	308	13.1	531 (26)	509	641	2.0 (0.5)	1.1	3.6
2004	19	18	37	1.6	612 (60)	560	817	3.1 (1.2)	1.9	6.7
2003	7	0	7	0.3	687 (82)	601	800	3.8 (1.3)	2.6	6.0
2002	5	0	5	0.2	702 (80)	647	831	4.0 (1.3)	3.0	6.4
2001	8	0	8	0.3	812 (88)	656	901	7.0 (2.1)	3.3	9.3
2000	4	0	4	0.2	812 (124)	647	900	6.7 (2.1)	3.4	9.0
1999	1	0	1	0.0	987			10.2		
1998										
1997	2	0	2	0.1	1,050 (18)	1,034	1,070	16.0 (0.2)	15.8	16.2
Totals	199	2,147	2,346	100.0						
<u>Female</u>										
2009	10	9	19	2.8	399 (29)	331	425	0.7 (0.1)	0.3	0.9
2008	47	191	238	35.3	466 (21)	420	515	1.0 (0.2)	0.6	1.7
2007	19	78	96	14.2	525 (19)	494	566	1.6 (0.2)	1.2	2.1
2006	17	60	77	11.4	543 (32)	500	626	1.8 (0.4)	1.2	2.7
2005	31	86	118	17.5	584 (32)	541	747	2.5 (0.6)	1.8	4.7
2004	25	40	65	9.6	614 (48)	563	822	3.2 (1.0)	1.7	6.4
2003	5	0	5	0.7	677 (42)	641	732	3.7 (0.7)	3.2	5.0
2002	2	0	2	0.3	787 (71)	736	846	6.5 (1.9)	4.6	8.4
2001	8	0	8	1.2	868 (98)	701	982	8.4 (2.7)	4.1	12.9
2000	7	0	7	1.0	955 (45)	924	1,034	11.3 (2.2)	9.4	16.0
1999	10	0	10	1.5	970 (26)	934	1,018	11.8 (1.4)	10.2	14.2
1998	6	0	6	0.9	1,045 (38)	1,015	1,100	15.8 (1.7)	14.0	18.8
1997	10	0	10	1.5	1,070 (47)	978	1,128	16.5 (2.6)	13.6	23.0
1996	12	0	12	1.8	1,041 (54)	950	1,162	15.0 (1.6)	13.0	19.0
1995	2	0	2	0.3	1,100 (18)	1,098	1,122	17.0 (1.1)	15.9	18.0
Totals	211	464	675	100.0						

Note. Table may not add due to rounding.

Table 20. Year class composition and mean length at age for a subsample of striped bass collected offshore North Carolina and Virginia during the striped bass Cooperative Tagging Survey, 2011. Standard deviations listed in parenthesis.

Year Class	N Aged	% Comp	Total Length (mm)		
			Mean	Min	Max
2005	2	1.9	670 (14)	660	680
2004	20	18.7	759 (31)	709	831
2003	46	43.0	802 (44)	673	880
2002	23	21.5	836 (52)	737	974
2001	8	7.5	840 (47)	769	906
2000	5	4.7	876 (55)	786	929
1999	1	0.9	904		
1998	1	0.9	931		
1997	1	0.9	1,080		
Totals	107	100			

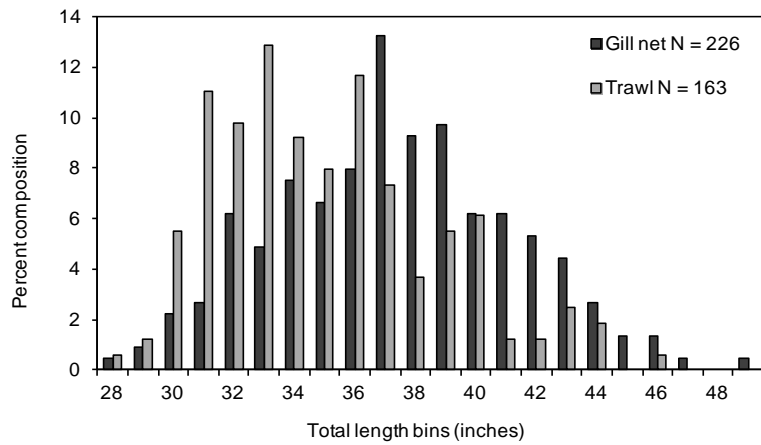


Figure 1. Length frequency of striped bass sampled from the 2011 calendar year Atlantic Ocean commercial harvest.

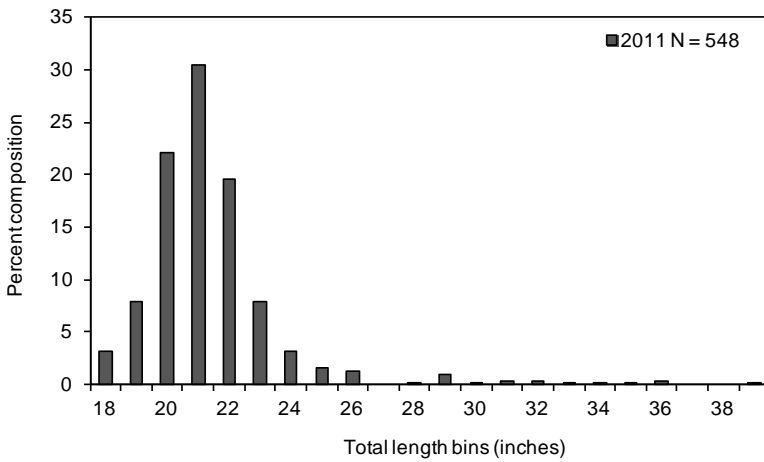


Figure 2. Length frequency of striped bass sampled from the Albemarle Sound Management Area spring 2011 commercial harvest.

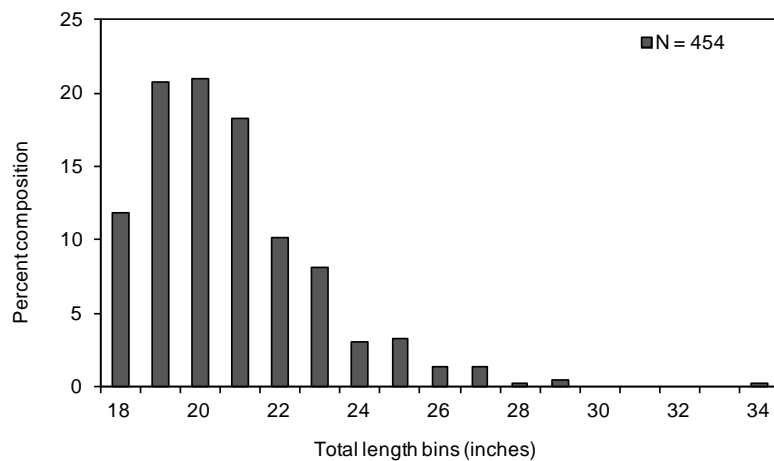


Figure 3. Length frequency of striped bass sampled from the Albemarle Sound Management Area fall 2011 commercial harvest.

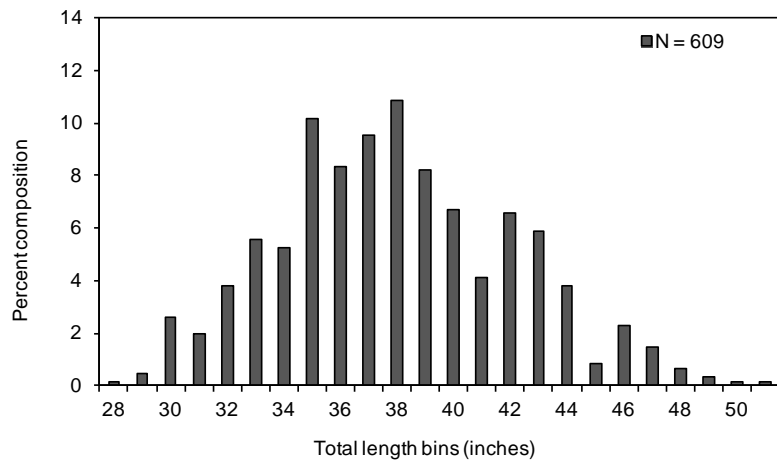


Figure 4. Length frequency of striped bass sampled from the Atlantic Ocean 2011 recreational harvest.

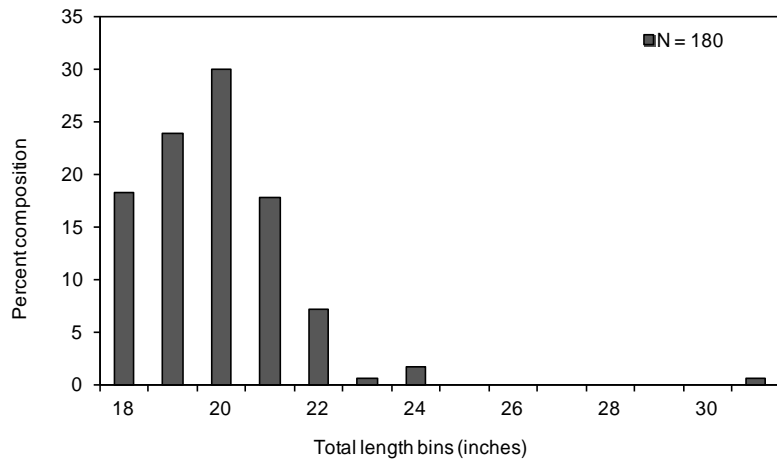


Figure 5. Length frequency of striped bass sampled from the Albemarle Sound Management Area spring 2011 recreational harvest.

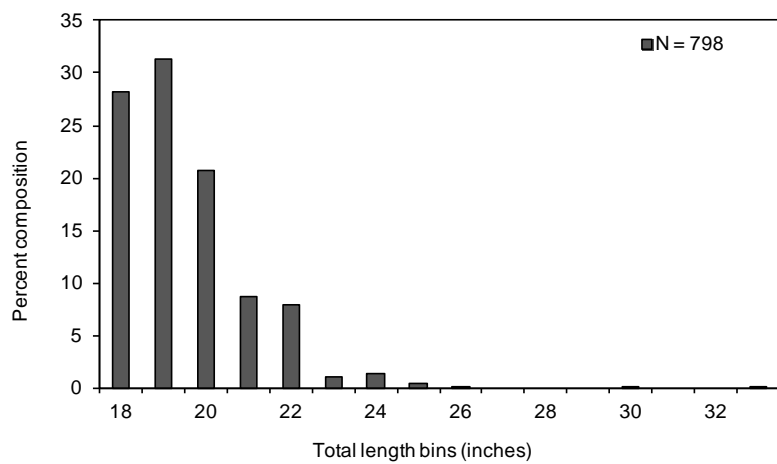


Figure 6. Length frequency of striped bass sampled from the Albemarle Sound Management Area fall 2011 recreational harvest.

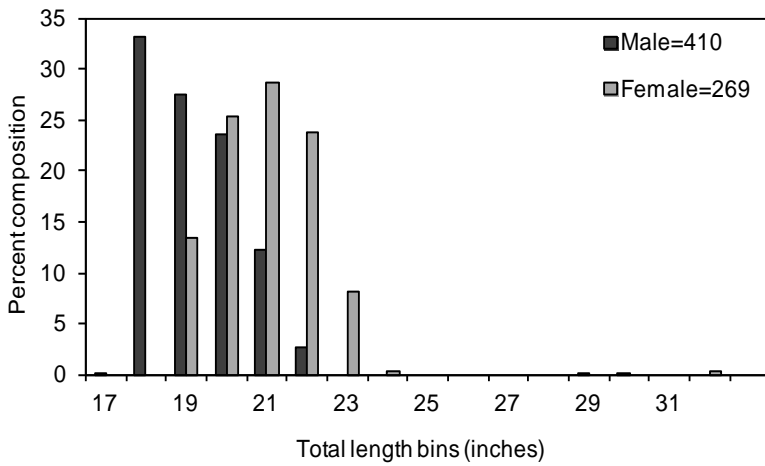


Figure 7. Length frequency of striped bass sampled from the Roanoke River Management Area 2011 recreational harvest. Note the no harvest slot limit of 22-27 inches TL. Male and female plots each sum separately to 100.

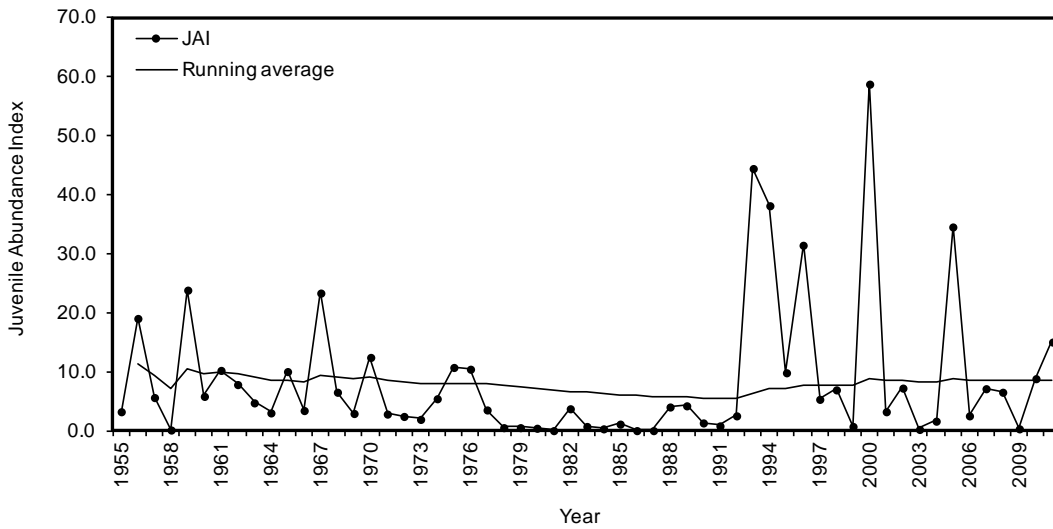


Figure 8. Juvenile Abundance Index (JAI) for A/R striped bass young-of-year trawl sampling in western Albemarle Sound NC 1955-2010.

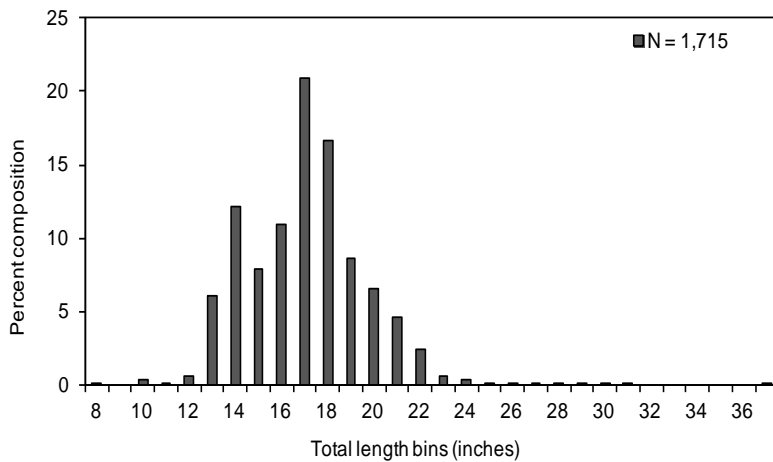


Figure 9. Length frequency of striped bass collected in the NCDMF spring A/R striped bass spawning stock independent gill net survey, western Albemarle Sound, NC, 2011.



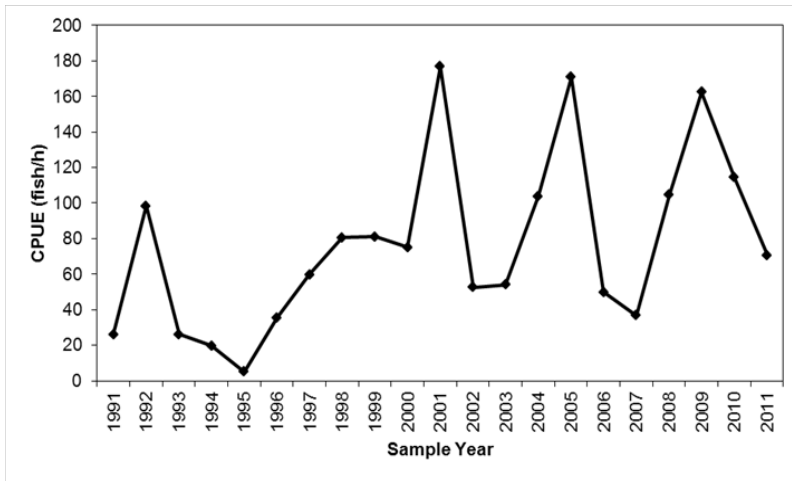


Figure 10. Relative abundance (overall pooled CPUE; fish/h) of striped bass collected by electrofishing during spawning stock surveys at Weldon, NC on Roanoke River; 1991–2011.

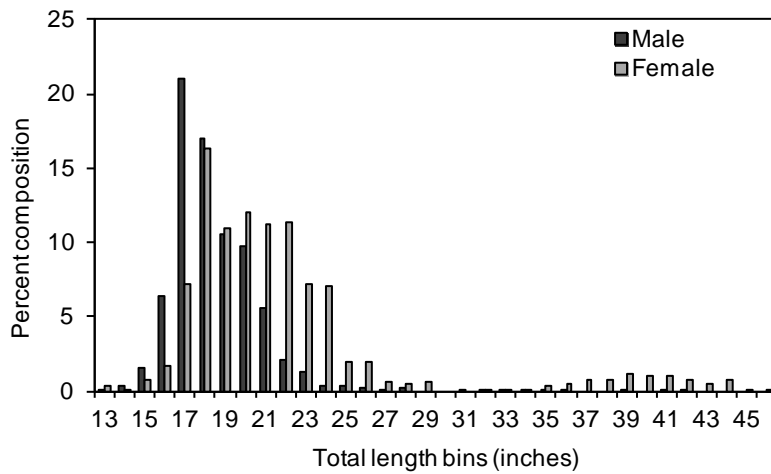


Figure 11. Length frequency histograms for striped bass collected from the Roanoke River, spring 2011. Male and female plots each sum separately to 100.

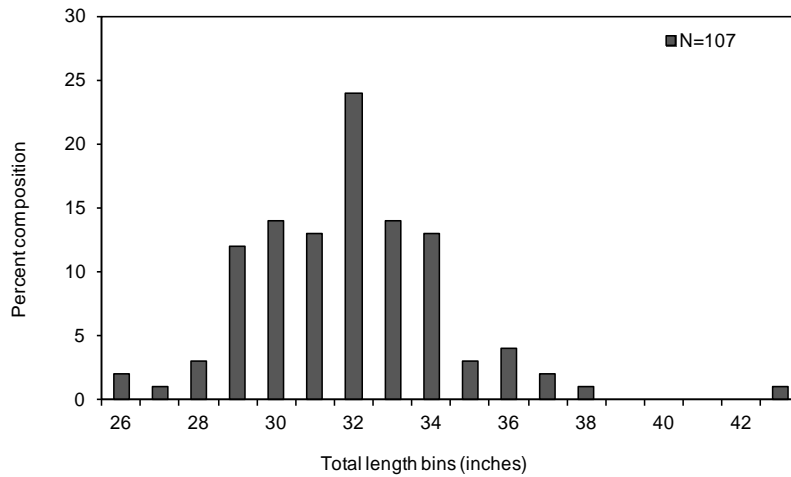


Figure 12. Length frequencies for striped bass collected offshore North Carolina and Virginia during the Cooperative Winter Tagging Cruise, 2011.

APPENDIX A1. Proclamations affecting striped bass recreational and commercial fisheries in the Atlantic Ocean and ASMA in NC in 2011. Proclamations can be found at <http://portal.ncdenr.org/web/mf/proclamations>

**ATLANTIC OCEAN GILL NET**

<b>Proclamation #</b>	<b>Open Date</b>	<b>Quota</b>	<b>Close Date</b>
FF-95-10	01/03/2011	10 fish	Open Jan 3, 4, 5 and 6, 2011
FF-1-2011	01/10/2011	20 fish	Open Jan 10, 11, 12 and 13, 2011
FF-9-2011	01/18/2011	20 fish	Open Jan 18, 19, 20 and 21, 2011
FF-18-2011	01/31/2011	20 fish	Jan 31, 2011
FF-24-2011	02/09/2011	20 fish	Feb 9, 2011
FF-28-2011	02/14/2011	20 fish	Feb 14, 2011

**ATLANTIC OCEAN BEACH SEINE**

<b>Proclamation #</b>	<b>Open Date</b>	<b>Quota</b>	<b>Close Date</b>
FF-96-2010	01/03/2011	150 fish	Jan 31, 2011
FF-17-2011	02/01/2011	150 fish	Feb 28, 2011
FF-78-2011	12/01/2011	150 fish	No close date

**ATLANTIC OCEAN TRAWL**

<b>Proclamation #</b>	<b>Open Date</b>	<b>Quota</b>	<b>Close Date</b>
FF-2-2011	01/10/2011	50 fish	Jan 14, 2011
FF-8-2011	01/15/2011	50 fish	Jan 20, 2011
FF-11-2011	01/24/2011	2,000 lbs	Jan 24-26, 2011
FF-21-2011	02/03/2011	2,000 lbs	Feb 3-4, 2011
FF-32-2011	02/24/2011	2,000 lbs	Feb 24-25, 2011

**ASMA – COMMERCIAL**

<b>Proclamation #</b>	<b>Open Date</b>	<b>Quota</b>	<b>Close Date</b>
FF-99-2010	01/01/2011	7 fish	Apr 14, 2011
FF-12-2011	02/01/2011	10 fish	Apr 14, 2011
FF-41-2011	03/14/2011	15 fish	Apr 14, 2011
FF-51-2011	04/14/2011	10 fish	Apr 30, 2011
FF-69-2011	10/01/2011	10 fish	December 31, 2011

**ASMA – RECREATIONAL**

<b>Proclamation #</b>	<b>Open Date</b>	<b>Quota</b>	<b>Close Date</b>
FF-98-2010	01/01/2011	3 fish	Apr 30, 2011
FF-67-2011	10/01/2011	3 fish	Apr 30, 2012

**RECREATIONAL ATLANTIC OCEAN OCRACOKE INLET TO NC/VA STATE LINE**

<b>Proclamation #</b>	<b>Open Date</b>	<b>Quota</b>	<b>Close Date</b>
FF-52-2011	05/01/2011	2 fish	Oct 31, 2011