

## **THE NEGLECTED ONE BILLION DOLLAR MA RECREATIONAL STRIPED BASS FISHERY**

The following economic summary was compiled by Frederic B. Jennings Jr., Economist (Harvard B.A. *magna cum laude*, Stanford Ph.D.) using the most recent NOAA data available. The methodologies employed to reach these conclusions were peer reviewed and vetted by NOAA Fisheries Economists Sabrina Lovell and Scott Steinback.

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- Each year the MA recreational striped bass fishery rivals our scallop fishery as our most economically valuable marine resource.<sup>1</sup>
- The MA recreational striped bass fishery is economically far more valuable than all of our other fin-fisheries combined.<sup>2</sup>
- In 2003 the total economic contribution of the MA recreational striped bass fishery to our economy was estimated to be in excess of \$1.1 billion dollars, with direct recreational expenditures in this fishery of \$650 million dollars.<sup>3</sup>
- In 2007, the direct recreational expenditures attributable to the MA recreational striped bass fishery were estimated to be about \$500 million dollars.<sup>4</sup>
- By 2016, the direct recreational expenditures in this fishery had diminished to just under \$350 million dollars in economic value in only nine years.<sup>5</sup>
- If the MA recreational striped bass fishery were brought back to as healthy a condition as it was in 2007, direct recreational expenditures would rise by 80 percent (or \$276 million) to about \$623 million dollars per year in economic value.<sup>6</sup>
- The decline in the economic value of the recreational striped bass fishery in MA directly coincides with the decline in the quality of, and consequently the participation by anglers in, the recreational wild striped bass fishery.
- The value of a wild striped bass caught recreationally (harvested or released) is worth roughly 20 times more to the economy of the Commonwealth than the same fish when harvested commercially.<sup>7</sup>
- Currently the 800,000 pounds of wild striped bass that is annually allocated for commercial harvesting is costing the Commonwealth close to \$100 million per year in unrealized economic activity in the recreational fishery.<sup>8</sup>
- Legislatively redirecting the MMFAC to manage the wild striped bass fishery for its greatest economic value to the Commonwealth would help to rebuild this fishery and increase direct recreational spending by \$250 to \$300 million dollars per year, and

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<sup>1</sup> See Exhibit 1 (p. 1 of 2), Exhibit 2A and 2B (FBJ Report 8/24/16 and Update), Exhibit 3 (NMFS Annual Commercial Landings in MA).

<sup>2</sup> See Exhibit 1 (p. 2 of 2), Exhibit 2A and 2B (FBJ Report 8/24/16 and Update), Exhibit 3 (NMFS Annual Commercial Landings in MA).

<sup>3</sup> From 2005 Southwick Report for MA (based on 2003 NOAA data), See Tables E-1, 6 and 17 on pages v, 10 and 23 (Exhibit 4).

<sup>4</sup> See Exhibit 2A, Table One; the precise figure is \$495,949,291 (also appears in Exhibit 1).

<sup>5</sup> See Exhibit 2B, Table One; the precise figure is \$346,368,829 (also appears in Exhibit 1).

<sup>6</sup> See Exhibit 2B, Table Two; the precise figures are 79.8% and \$276,338,092 to \$622,706,919 (this figure is not shown in Exhibit 2B).

<sup>7</sup> From 2005 Southwick Report for MA (based on 2003 NOAA data). See Tables E-1, 6 and 9 on pages v, 10 and 13 (Exhibit 4).

<sup>8</sup> Southwick argued that wild striped bass caught recreationally were worth about \$133/pound based on recreational expenditures, while worth only \$6.00/pound in the commercial harvest (yielding an implied loss per pound of \$127/pound). Multiplying that implied loss per pound by the current MA annual commercial quota of 800,000 pounds of wild striped bass yields \$101,600,000.

restore almost 7000 jobs in the recreational striped bass fishery that have been lost since 2007 due to commercially biased management goals and objectives.<sup>9</sup>

- Establishing a policy directive requiring the MMFAC to reprioritize their goals and to implement same will involve zero cost to the Commonwealth and generate around \$300 million dollars' worth of additional economic activity in this state each year.<sup>10</sup>



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<sup>9</sup> See Exhibit 2B, Table Two; the precise spending and jobs figures are \$276,338,090 and 6,908 jobs.

<sup>10</sup> The additional economic activity likely to be generated by a healthy and robust recreational wild striped bass fishery is hard to assess with any precision, but the data presented in Table Two of Exhibit 2A suggest that this estimate may be quite conservative.

**COMPARISON OF MA RECREATIONAL WILD STRIPED BASS DIRECT EXPENDITURES  
WITH THE VALUE OF ANNUAL COMMERCIAL LANDINGS OF SEA SCALLOPS IN MA**

**EXHIBIT ONE (p. 1 of 2)**

<b><u>Year</u></b>	<b><u>Recreational WSB Expenditures</u></b>	<b><u>Commercial Sea Scallops Landings</u></b>	<b><u>WSB/SS (\$)</u></b>	<b><u>WSB/SS (%)</u></b>	<b><u>WSB&gt;SS (%)</u></b>
2006	\$463,101,566	\$234,796,388	1.9724	197.24%	97.24%
2007	\$495,949,291	\$218,291,874	2.2720	227.20%	127.20%
<b>2008</b>	<b>\$466,205,750</b>	<b>\$189,891,395</b>	<b>2.4551</b>	<b>245.51%</b>	<b>145.51%</b> largest difference
2009	\$389,755,315	\$197,280,495	1.9756	197.56%	97.56%
2010	\$346,935,787	\$252,253,367	1.3753	137.53%	37.53%
<b>2011</b>	<b>\$390,804,072</b>	<b>\$330,943,531</b>	<b>1.1809</b>	<b>118.09%</b>	<b>18.09%</b> smallest difference
2012	\$436,079,925	\$364,863,812	1.1952	119.52%	19.52%
2013	\$457,277,829	\$334,205,322	1.3683	136.83%	36.83%
2014	\$508,799,171	\$271,373,414	1.8749	187.49%	87.49%
2015	\$324,755,392	\$264,933,400	1.2258	122.58%	22.58%
2016	\$346,368,829	\$281,444,674	1.2307	123.07%	23.07%
<b>Average:</b>	<b>\$420,548,447.91</b>	<b>\$267,297,970.18</b>	<b>1.5733</b>	<b>157.33%</b>	<b>57.33%</b> average difference

See FBJ Report 8/24/16      NMFS Data (Exhibit 3)

**COMPARISON OF MA RECREATIONAL WILD STRIPED BASS DIRECT EXPENDITURES  
WITH THE VALUE OF ANNUAL COMMERCIAL LANDINGS OF ALL FIN FISH IN MA**

**EXHIBIT ONE (p. 2 of 2)**

<b><u>Year</u></b>	<b><u>Recreational WSB Expenditures</u></b>	<b><u>Commercial Fin Fish Landings</u></b>	<b><u>WSB/FF (\$)</u></b>	<b><u>WSB/FF (%)</u></b>	<b><u>WSB&gt;FF (%)</u></b>
2006	\$463,101,566	\$252,170,517	1.8365	183.65%	83.65% smallest difference
2007	\$495,949,291	\$109,089,257	4.5463	454.63%	354.63%
<b>2008</b>	<b>\$466,205,750</b>	<b>\$121,567,219</b>	3.8350	383.50%	283.50%
2009	\$389,755,315	\$113,972,752	3.4197	341.97%	241.97%
2010	\$346,935,787	\$126,261,509	2.7478	274.78%	174.78%
<b>2011</b>	<b>\$390,804,072</b>	<b>\$132,330,128</b>	2.9533	295.33%	195.33%
2012	\$436,079,925	\$126,107,939	3.4580	345.80%	245.80%
2013	\$457,277,829	\$93,898,466	4.8699	486.99%	386.99%
2014	\$508,799,171	\$103,558,065	<b>4.9132</b>	<b>491.32%</b>	<b>391.32%</b> largest difference
2015	\$324,755,392	\$99,081,995	3.2776	327.76%	227.76%
2016	\$346,368,829	\$99,034,024	3.4975	349.75%	249.75%
<b>Average:</b>	<b>\$420,548,447.91</b>	<b>\$125,188,351.91</b>	<b>3.3593</b>	<b>335.93%</b>	<b>235.93%</b> average difference

See FBJ Report 8/24/16      NMFS Data (Exhibit 3)

# EXHIBIT 2A

## A REPORT ON THE ECONOMIC VALUE AND IMPACT OF THE MA RECREATIONAL WILD STRIPED BASS FISHERY

### CONTENTS

1. REPORT SUMMARY
2. EXPLANATION OF FBJ ANALYSIS
3. SPREADSHEET WITH TABLES ONE, TWO AND THREE

### REPORT SUMMARY

24 August 2016

This most recent report identifies the economic value of the *recreational* wild striped bass (WSB) fishery in Massachusetts and compares it to the economic value of the *commercial* marine fishing industry in the Commonwealth. To ensure scientific accuracy and independent credibility, an earlier version of this analysis was reviewed by two senior fisheries economists at NOAA (Drs. Scott Steinback and Sabrina Lovell), co-authors of NOAA's September 2013 Report called "The Economic Contribution of Marine Angler Expenditures in the United States, 2011." Because of their generous contributions of time, insight and experience, it was possible to make this economic analysis even more detailed and relevant to the management decisions regarding our limited and valuable marine fisheries resources. I am most grateful for their professional input and guidance on this study.

The basic conclusions of this report show that the MA recreational WSB fishery is one of the most economically valuable in the state, rivaling the MA sea scallop fishery in its spending and economic impacts on the economy of the Commonwealth.

1. In its annual direct spending effects, the MA recreational WSB fishery is on average worth over **130** times the value of annual commercial WSB fishery landings in MA.
2. In its annual direct spending, the MA recreational WSB fishery totals, on average during the ten years from 2006 to 2015, over three and a half times (or **361.3%** of) the total landed value of MA commercial landings of finfish, and almost 90 percent (or **88.9%**) of the worth of the total annual landings of the entire MA seafood industry.

3. The average economic impacts<sup>1</sup> on sales, income and profits (“value added”) of the recreational WSB fishery are **88-112%** of those for the MA commercial finfish industry, making them approximately equal in their overall economic impact.<sup>2</sup>
4. The average economic impacts (in dollars) of the MA recreational WSB fishery are **22-26%** of those for the entire MA commercial seafood industry between 2006 and 2015.
5. Even in its currently depleted condition, the MA recreational WSB fishery rivals the MA sea scallop fishery in its economic contributions. The value of annual landings in MA of sea scallops have averaged just over **half** (or **52.2%** of) that of all MA seafood industry landings from 2006 to 2014, while the average annual worth of expenditures by WSB anglers is a larger percentage (**88.9%**) of the value of all MA seafood industry landings.
6. Were the MA recreational WSB fishery managed for recreational abundance as a game species, rather than being commercially overexploited for a minimum value, the economic significance of this fishery in both its spending and economic impacts (based on the peak year of WSB angling trips in 2007) would increase by the following amounts (based on NOAA data): **\$290 million** (or 93%) in direct spending; and 150% increases in the form of **3,964 more jobs**; **\$428 million** in more sales; **\$196 million** in more income; and **\$289 million** in more profits.

This recently completed analysis shows that the MA recreational WSB fishery, rather than being just a playground for the idle rich, is one of the most important MA marine fisheries in its economic impact. These results suggest that the MA recreational WSB fishery ought to be managed for its maximum economic contribution and value as an exclusively recreational fishery by declaring striped bass a game species in Massachusetts coastal waters. This strategic shift would allow this important fishery to be managed for better conservation and abundance, assuring us of a healthy recreational sport fishery in MA for many years to come. Massachusetts could once again become known as “the place to go” for great saltwater fishing as a worldwide tourist angling destination.

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<sup>1</sup> These impacts need to be compared separately, as they are not independent categories. Summing them up, as I did in the earlier report, involved some (unquantifiable) multiple counting due to these measurement overlaps.

<sup>2</sup> The jobs and sales impacts are for 2006 to 2014; the income impacts are measured from 2009-2014 and the profit (“value added”) impacts are from 2007-2014, due to unavailable data for the earlier years.

# **Explanation of FBJ Analysis of the Economics of the MA Striped Bass Fishery**

Frederic B. Jennings Jr., Ph.D. – 24 August 2016

The attached analysis reveals the economic importance of the MA recreational wild striped bass (WSB) fishery. The spreadsheet has three tables showing that the direct annual expenditures of MA recreational WSB anglers averages almost **90%** of the value of annual commercial landings for *the entire MA seafood industry!* When the full economic impacts of these two sectors are compared, the average annual impact of the MA recreational WSB fishery on sales, income and profits is **22-26%** of the impact of the entire MA commercial seafood industry over the last 10 years. These results show that the MA recreational WSB fishery is by far one of the most important marine fisheries in this state, perhaps rivaled only by the MA scallop fishery in its full economic impact.

**Table One** shows the annual recreational catch of WSB in MA from 2006 to 2015 (with the percentage loss therein relative to the peak catch in 2006). The next three lines show the same annual data for recreational WSB fishing trips in MA (compared to the peak in 2007). Then angler expenditures per trip are shown for each year by mode, based on NOAA data from 2006 to 2013 (extrapolated for subsequent years using regional Consumer Price Index [CPI] data). The number of WSB trips are then applied to expenditures per trip to derive total angler expenditures per year by mode on WSB fishing trips and related equipment for 2006 to 2015. The next set of lines shows similar data for the economic impact of MA recreational WSB angling on jobs, sales, income and profits, while the final set of lines in **Table One** shows the economic value and impact per fish caught in each year. Finally, the last three columns in the lower half of **Table One** compare the actual 2015 annual WSB recreational spending and impact (per year and per fish) to what it would have been in 2015 with the number of WSB angling trips taken in 2007 and in 2014.

**Table Two** then summarizes this last comparison between 2015 actual data with what it would have been with the number of WSB trips in 2007 and 2014 to show implied losses in direct expenditures due to declining recreational WSB catches and trips of almost **\$300 million** in the 8 years since 2007, and of over **\$126 million** in just one single year alone. The annual losses in economic impact on jobs, sales, income and profits due to declining WSB trips for those years are much larger. Were the 2007 trips taken in 2015, the state would have seen a 93% increase in **3,964 more jobs**, and almost a 150% increase in sales of **\$428 million**; in income of **\$196 million**; and in profits of **\$289 million**. In just a single year, since 2014, the decline in the WSB recreational fishery due to fewer WSB trips has denied us a 40% spending boost of **\$126 million**; a 65% job increase of **1,744 jobs**; and a 65% rise in sales (**\$189 million**), incomes (**\$87 million**) and profits (**\$127 million**). These shortfalls translate directly into annual losses in tax revenues for the MA state economy.

**Table Three** compares the size and economic importance of the MA commercial and recreational WSB fisheries thus:

- (1) In dollar value, the recreational WSB fishery spends **132 times** the annual value of MA commercial WSB landings.
- (2) MA direct recreational WSB spending averages **3.6 times** the average value of MA commercial finfish landings.
- (3) The recreational WSB fishery spends an average of **89%** of the full value of MA commercial seafood landings.
- (4) The recreational WSB fishery is worth **87.6%** of the entire MA finfish industry in its impact on sales; for income, it is worth **1% more** than the finfish industry's impact; and its profit impact is **12% higher** than that for all finfish.
- (5) The sales and income impact of the MA recreational WSB fishery is worth **22%** of that of the entire MA seafood industry, while the MA recreational WSB fishery's profit impact is worth **26%** of that of the MA seafood industry.

**BOTTOM LINE:** The spending effects and full economic impacts of the *MA recreational WSB fishery* – with respect to its role in the state's economy (and thus on jobs and taxable revenues) – makes it one of our most important fisheries. With a healthy WSB fishery – managed for conservation and abundance – the economic impact of the MA recreational WSB fishery would double or more, growing to more than half the economic impact of the entire MA seafood industry.

The relative economic value and impact of the *MA commercial WSB fishery* is quite trivial when compared with the value of the *MA recreational WSB fishery*, with a negligible economic contribution to our state's economy. Making WSB a gamefish, and ending the wasteful commercial harvest of this valuable sport fish, should have a major positive impact on the MA state economy by allowing the WSB fishery to recover from its currently depleted state, with a potential economic impact of far more than \$500 million per year (as suggested in **Table Two**). We need to rethink our approach to the management of this extremely valuable fishery in the Commonwealth of Massachusetts.

Respectfully submitted,

Frederic B. Jennings Jr., Ph.D.

TABLE ONE: REVENUE IMPACT OF DECLINING WILD STRIPED BASS RECREATIONAL FISHING TRIPS COMPARED TO THE COMMERCIAL FISHERY IN MA FROM 2006 TO 2015

	Year:	2006	2007	2008	2009	2010	2011
<b>Recreational Catch of WSB in MA, 2000-2015</b>		<b>8,124,766</b>	5,646,880	4,027,374	2,627,003	2,012,483	1,228,699
% of WSB Caught relative to Peak Year in 2006		100.0%	69.5%	49.6%	32.3%	24.8%	15.1%
% of WSB Catch Shortfall relative to Peak in 2006		0.0%	30.5%	50.4%	67.7%	75.2%	84.9%
<b>Recreational WSB Fishing Trips in MA, 2000-2015</b>		<b>2,816,805</b>	<b>3,014,182</b>	2,829,096	2,157,200	1,967,823	1,560,356
% of MA WSB Trips relative to Peak Year in 2007		93.5%	100.0%	93.9%	71.6%	65.3%	51.8%
% of MA WSB Trip Shortfall relative to Peak in 2007		6.5%	0.0%	6.1%	28.4%	34.7%	48.2%
CPI data for Boston - Brockton area (1984=100)		223.1	227.4	235.4	233.8	237.4	243.9
<b>RECREATIONAL ANGLER EXPENDITURES PER TRIP</b>	<b>Year:</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Recreational Shore Fishing Expenditures per trip per year		\$77.33	\$78.36	\$74.02	\$79.47	\$76.97	\$52.69
Recreational Pvt Boat Fishing Expenditures per trip per year		\$30.25	\$30.25	\$31.64	\$34.29	\$34.35	\$58.85
Recreational For-Hire Fishing Expenditures per trip per year		<u>\$149.65</u>	<u>\$151.45</u>	<u>\$139.27</u>	<u>\$147.13</u>	<u>\$152.46</u>	<u>\$274.06</u>
Total Recreational Direct Trip Expenditures per trip per year		<u>\$56.19</u>	<u>\$56.66</u>	<u>\$55.78</u>	<u>\$61.13</u>	<u>\$54.07</u>	<u>\$70.48</u>
Recreational Durable Equipment Expenses per trip per year		<u>\$112.26</u>	<u>\$110.52</u>	<u>\$111.37</u>	<u>\$121.71</u>	<u>\$125.66</u>	<u>\$186.15</u>
Total Recreational Trip and Equipment Expenditures per trip per year:		<u>\$168.44</u>	<u>\$167.18</u>	<u>\$167.16</u>	<u>\$182.84</u>	<u>\$179.73</u>	<u>\$256.63</u>
Average of above (assumes 50% durable eqpt expenses scaled upward)		\$112.31	\$111.92	\$111.47	\$121.99	\$116.90	\$163.55
<b>RECREATIONAL ANGLING ECONOMIC IMPACTS PER TRIP</b>	<b>Year:</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Employment Impacts per Recreational Trip by Mode</b>							
Employment Impacts per Trip of Shore Fishing Trips by year		0.0011	0.0011	0.0010	0.0011	0.0011	0.0006
Employment Impacts per Trip of Private Boat Fishing Trips by year		0.0003	0.0003	0.0003	0.0003	0.0003	0.0005
Employment Impacts per Trip of For-Hire Fishing Trips by Year		0.0023	0.0024	0.0022	0.0023	0.0024	0.0039
Employment Impacts per Trip of Durable Eqpt Purchases by Year		0.0006	0.0006	0.0006	0.0007	0.0007	0.0016
Total Employment Impacts per Recreational Angling Trip:		0.0013	0.0013	0.0013	0.0014	0.0013	0.0023
<b>Sales Impacts per Recreational Trip by Mode</b>							
Sales Impacts per Trip of Shore Fishing Trips by year		\$111.03	\$112.51	\$106.28	\$114.10	\$110.51	\$76.57
Sales Impacts per Trip of Private Boat Fishing Trips by year		\$33.83	\$33.83	\$35.38	\$38.35	\$38.42	\$66.80
Sales Impacts per Trip of For-Hire Fishing Trips by Year		\$226.01	\$228.73	\$210.32	\$222.19	\$230.24	\$450.51
Sales Impacts per Trip of Durable Eqpt Purchases by Year		<u>\$99.07</u>	<u>\$97.54</u>	<u>\$98.29</u>	<u>\$107.42</u>	<u>\$110.91</u>	<u>\$187.02</u>
Total Sales Impacts per Recreational Angling Trip:		<u>\$175.25</u>	<u>\$174.39</u>	<u>\$173.78</u>	<u>\$190.40</u>	<u>\$182.33</u>	<u>\$284.19</u>
<b>Income Impacts per Recreational Trip by Mode</b>							
Income Impacts per Trip of Shore Fishing Trips by year		n.a.	n.a.	n.a.	\$40.84	\$39.55	\$27.87
Income Impacts per Trip of Private Boat Fishing Trips by year		n.a.	n.a.	n.a.	\$14.04	\$14.07	\$24.68
Income Impacts per Trip of For-Hire Fishing Trips by Year		n.a.	n.a.	n.a.	\$77.90	\$80.72	\$216.52
Income Impacts per Trip of Durable Eqpt Purchases by Year		n.a.	n.a.	n.a.	<u>\$36.64</u>	<u>\$37.83</u>	<u>\$84.80</u>
Total Income Impacts per Recreational Angling Trip:		n.a.	n.a.	n.a.	<u>\$66.39</u>	<u>\$63.51</u>	<u>\$123.87</u>
<b>Value Added Impacts per Recreational Trip by Mode</b>							
Value Added Impacts per Trip of Shore Fishing Trips by year		\$65.74	\$66.61	\$62.93	\$67.56	\$65.43	\$45.17
Value Added Impacts per Trip of Private Boat Fishing Trips by year		\$20.74	\$20.74	\$21.69	\$23.51	\$23.55	\$40.88
Value Added Impacts per Trip of For-Hire Fishing Trips by Year		\$134.84	\$136.46	\$125.48	\$132.57	\$137.36	\$317.87
Value Added Impacts per Trip of Durable Eqpt Purchases by Year		<u>\$49.79</u>	<u>\$49.02</u>	<u>\$49.39</u>	<u>\$53.98</u>	<u>\$55.73</u>	<u>\$130.72</u>
Total Value Added Impacts per Recreational Angling Trip:		<u>\$95.32</u>	<u>\$94.94</u>	<u>\$94.53</u>	<u>\$103.59</u>	<u>\$98.56</u>	<u>\$192.24</u>
<b>TOTAL RECREATIONAL WSB ANGLER EXPENDITURES PER YEAR</b>							
Recreational Shore Fishing WSB Trip Expenditures		\$88,956,652	\$103,050,215	\$90,406,147	\$75,976,979	\$51,118,139	\$38,924,693
Recreational Private Boat WSB Trip Expenditures		\$48,502,022	\$49,316,302	\$47,971,391	\$38,134,851	\$43,695,473	\$44,775,621
Recreational For-Hire WSB Trip Expenditures		<u>\$9,438,590</u>	<u>\$10,444,595</u>	<u>\$12,743,113</u>	<u>\$13,093,925</u>	<u>\$4,835,781</u>	<u>\$16,639,503</u>
Recreational Direct WSB Trip Expenditures per year		<u>\$146,897,264</u>	<u>\$162,811,112</u>	<u>\$151,120,651</u>	<u>\$127,205,754</u>	<u>\$99,649,394</u>	<u>\$100,339,817</u>
Recreational Durable Equipment WSB Expenditures per year		<u>\$316,204,302</u>	<u>\$333,138,180</u>	<u>\$315,085,092</u>	<u>\$262,549,561</u>	<u>\$247,286,393</u>	<u>\$290,464,255</u>
Recreational Total WSB Expenditures per year:		<u>\$463,101,566</u>	<u>\$495,949,291</u>	<u>\$466,205,750</u>	<u>\$389,755,315</u>	<u>\$346,935,787</u>	<u>\$390,804,072</u>
<b>TOTAL RECREATIONAL WSB ANGLING ECONOMIC IMPACTS PER YEAR</b>							
<b>Employment Impacts of Recreational WSB Fishery by Mode</b>							
Employment Impacts of Shore WSB Fishing Trips by year		1,238	1,435	1,258	1,058	711	449
Employment Impacts of Private Boat WSB Fishing Trips by year		464	472	458	365	417	351
Employment Impacts of For-Hire WSB Fishing Trips by Year		148	164	200	205	76	234
Employment Impacts of Durable Eqpt Purchases for WSB by Year		<u>1,695</u>	<u>1,786</u>	<u>1,689</u>	<u>1,407</u>	<u>1,326</u>	<u>2,450</u>
Total Employment Impacts of Recreational WSB Fishery:		<u>3,545</u>	<u>3,856</u>	<u>3,606</u>	<u>3,035</u>	<u>2,531</u>	<u>3,485</u>
<b>Sales Impacts of Recreational WSB Fishery by Mode</b>							
Sales Impacts of Shore WSB Fishing Trips by Year (\$000)		\$127,722,642	\$147,957,887	\$129,803,551	\$109,086,751	\$73,394,550	\$56,568,706
Sales Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$54,241,745	\$55,152,602	\$53,648,041	\$42,648,516	\$48,866,626	\$50,827,253
Sales Impacts of For-Hire WSB Fishing Trips by Year (\$000)		\$14,254,789	\$15,774,114	\$19,245,053	\$19,774,597	\$7,303,105	\$27,352,651
Sales Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		<u>\$279,071,458</u>	<u>\$294,016,811</u>	<u>\$278,083,532</u>	<u>\$231,717,351</u>	<u>\$218,246,758</u>	<u>\$291,821,920</u>
Total Sales Impacts of Recreational WSB Fishery:		<u>\$475,290,633</u>	<u>\$512,901,413</u>	<u>\$480,780,177</u>	<u>\$403,227,215</u>	<u>\$347,811,038</u>	<u>\$426,570,531</u>
<b>Income Impacts of Recreational WSB Fishery by Mode</b>							
Income Impacts of Shore WSB Fishing Trips by Year (\$000)		n.a.	n.a.	n.a.	\$39,040,284	\$26,266,875	\$20,593,642
Income Impacts of Private Boat WSB Fishing Trips by Year (\$000)		n.a.	n.a.	n.a.	\$15,617,713	\$17,894,771	\$18,776,910
Income Impacts of For-Hire WSB Fishing Trips by Year (\$000)		n.a.	n.a.	n.a.	\$6,932,514	\$2,560,228	\$13,146,134
Income Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		n.a.	n.a.	n.a.	<u>\$79,040,518</u>	<u>\$74,445,577</u>	<u>\$132,311,298</u>
Total Income Impacts of Recreational WSB Fishery:		n.a.	n.a.	n.a.	<u>\$140,631,029</u>	<u>\$121,167,451</u>	<u>\$184,827,983</u>
<b>Value Added Impacts of Recreational WSB Fishery by Mode</b>							
Value Added Impacts of Shore WSB Fishing Trips by Year (\$000)		\$75,622,624	\$87,603,791	\$76,854,625	\$64,588,472	\$43,455,708	\$33,368,955
Value Added Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$33,256,610	\$33,814,736	\$32,892,667	\$26,148,547	\$29,960,597	\$31,105,208
Value Added Impacts of For-Hire WSB Fishing Trips by Year (\$000)		\$8,504,544	\$9,411,020	\$11,481,660	\$11,797,996	\$4,357,074	\$19,299,759
Value Added Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		<u>\$140,239,105</u>	<u>\$147,749,301</u>	<u>\$139,743,036</u>	<u>\$116,442,922</u>	<u>\$109,673,265</u>	<u>\$203,975,804</u>
Total Value Added Impacts of Recreational WSB Fishery:		<u>\$257,622,883</u>	<u>\$278,578,848</u>	<u>\$260,971,989</u>	<u>\$218,977,936</u>	<u>\$187,446,645</u>	<u>\$287,749,725</u>
<b>RECREATIONAL WSB ANGLER EXPENDITURES AND IMPACTS PER FISH</b>							
Recreational WSB Angler Expenditures per Fish Caught:		\$57.00	\$87.83	\$115.76	\$148.37	\$172.39	\$318.06
Recreational WSB Angling Sales Impact per Fish Caught:		\$58.50	\$90.83	\$119.38	\$153.49	\$172.83	\$347.17
Recreational WSB Angling Income Impact per Fish Caught:		n.a.	n.a.	n.a.	\$53.53	\$60.21	\$100.43
Recreational WSB Angling Value Added Impact per Fish Caught:		\$31.71	\$49.33	\$64.80	\$83.36	\$93.14	\$234.19

**TABLE ONE: REVENUE IMPACT OF DECLINING WILD STRIPED BASS RECREATIONAL FISHING TRIPS COMPARED TO THE COMMERCIAL FISHERY IN MA FROM 2006 TO 2015 (continued)**

	Year (continued):	2012	2013	2014	2015 Prelim Est	2015 w/ 2007 trips	2015 w/ 2014 trips
Recreational Catch of WSB in MA, 2000-2015		1,367,440	1,989,972	2,103,549	1,683,598	5,646,880	2,103,549
% of WSB Caught relative to Peak Year in 2006		16.8%	24.5%	25.9%	20.7%	69.5%	25.9%
% of WSB Catch Shortfall relative to Peak in 2006		83.2%	75.5%	74.1%	79.3%	30.5%	74.1%
Recreational WSB Fishing Trips in MA, 2000-2015		1,650,954	1,761,750	1,959,099	1,209,079	3,014,182	1,959,099
% of MA WSB Trips relative to Peak Year in 2007		54.8%	58.4%	65.0%	40.1%	100.0%	65.0%
% of MA WSB Trip Shortfall relative to Peak in 2007		45.2%	41.6%	35.0%	59.9%	0.0%	35.0%
CPI data for Boston - Brockton area (1984=100)		247.7	251.1	255.2	256.7	256.7	256.7
Year:		2012	2013	2014	2015 Prelim Est	2015 w/ 2007 trips	2015 w/ 2014 trips
<b>RECREATIONAL ANGLER EXPENDITURES PER TRIP</b>							
Total Recreational Direct Trip Expenditures per trip per year		\$74.13	\$77.08	\$78.32	\$78.79	\$78.79	\$78.79
Recreational Durable Equipment Expenses per trip per year		<u>\$197.81</u>	<u>\$189.59</u>	<u>\$192.64</u>	<u>\$193.80</u>	<u>\$193.80</u>	<u>\$193.80</u>
Total Recreational Trip and Equipment Expenditures per trip per year:		\$271.94	\$266.67	\$270.96	\$272.59	\$272.59	\$272.59
Average of above (assumes 50% durable eqpt expenses scaled upward)		\$173.03	\$171.88	\$174.64	\$175.69	\$175.69	\$175.69
<b>RECREATIONAL ANGLING ECONOMIC IMPACTS PER TRIP</b>							
<b>Employment Impacts per Recreational Trip by Mode</b>							
Employment Impacts per Trip of Shore Fishing Trips by year		0.0007	0.0007	0.0006	0.0006	0.0006	0.0006
Employment Impacts per Trip of Private Boat Fishing Trips by year		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Employment Impacts per Trip of Far-Hire Fishing Trips by Year		0.0038	0.0040	0.0039	0.0039	0.0039	0.0039
Employment Impacts per Trip of Durable Eqpt Purchases by Year		<u>0.0017</u>	<u>0.0015</u>	<u>0.0016</u>	<u>0.0016</u>	<u>0.0016</u>	<u>0.0016</u>
Total Employment Impacts per Recreational Angling Trip:		0.0025	0.0024	0.0024	0.0024	0.0024	0.0024
<b>Sales Impacts per Recreational Trip by Mode</b>							
Sales Impacts per Trip of Shore Fishing Trips by year		\$84.00	\$70.28	\$71.41	\$71.84	\$71.84	\$71.84
Sales Impacts per Trip of Private Boat Fishing Trips by year		\$68.41	\$59.92	\$60.89	\$61.25	\$61.25	\$61.25
Sales Impacts per Trip of Far-Hire Fishing Trips by Year		\$438.97	\$445.48	\$452.65	\$455.37	\$455.37	\$455.37
Sales Impacts per Trip of Durable Eqpt Purchases by Year		<u>\$198.80</u>	<u>\$159.44</u>	<u>\$162.01</u>	<u>\$162.98</u>	<u>\$162.98</u>	<u>\$162.98</u>
Total Sales Impacts per Recreational Angling Trip:		\$300.20	\$257.09	\$261.23	\$262.80	\$262.80	\$262.80
<b>Income Impacts per Recreational Trip by Mode</b>							
Income Impacts per Trip of Shore Fishing Trips by year		\$30.58	\$29.62	\$30.09	\$30.27	\$30.27	\$30.27
Income Impacts per Trip of Private Boat Fishing Trips by year		\$25.25	\$27.11	\$27.55	\$27.71	\$27.71	\$27.71
Income Impacts per Trip of Far-Hire Fishing Trips by Year		\$210.94	\$219.78	\$223.32	\$224.66	\$224.66	\$224.66
Income Impacts per Trip of Durable Eqpt Purchases by Year		<u>\$90.20</u>	<u>\$73.94</u>	<u>\$75.13</u>	<u>\$75.58</u>	<u>\$75.58</u>	<u>\$75.58</u>
Total Income Impacts per Recreational Angling Trip:		\$130.97	\$118.94	\$120.85	\$121.58	\$121.58	\$121.58
<b>Value Added Impacts per Recreational Trip by Mode</b>							
Value Added Impacts per Trip of Shore Fishing Trips by year		\$49.54	\$45.43	\$46.16	\$46.44	\$46.44	\$46.44
Value Added Impacts per Trip of Private Boat Fishing Trips by year		\$41.89	\$39.87	\$40.51	\$40.75	\$40.75	\$40.75
Value Added Impacts per Trip of Far-Hire Fishing Trips by Year		\$309.74	\$283.88	\$288.45	\$290.18	\$290.18	\$290.18
Value Added Impacts per Trip of Durable Eqpt Purchases by Year		<u>\$138.86</u>	<u>\$109.20</u>	<u>\$110.96</u>	<u>\$111.63</u>	<u>\$111.63</u>	<u>\$111.63</u>
Total Value Added Impacts per Recreational Angling Trip:		\$203.12	\$172.58	\$175.36	\$176.42	\$176.42	\$176.42
<b>TOTAL RECREATIONAL WSB ANGLER EXPENDITURES PER YEAR</b>							
Recreational Share Fishing WSB Trip Expenditures		\$39,467,342	\$29,518,853	\$48,733,300	\$30,285,613	\$72,785,694	\$49,025,680
Recreational Private Boat WSB Trip Expenditures		\$54,950,548	\$68,969,563	\$62,235,558	\$39,523,136	\$102,198,098	\$62,608,946
Recreational Far-Hire Fishing WSB Trip Expenditures		<u>\$15,091,363</u>	<u>\$24,785,401</u>	<u>\$20,429,296</u>	<u>\$8,661,357</u>	<u>\$18,986,707</u>	<u>\$20,551,863</u>
Recreational Direct WSB Trip Expenditures per year		\$109,509,253	\$123,273,818	\$131,398,154	\$78,470,106	\$193,970,499	\$132,186,489
Recreational Durable Equipment WSB Expenditures per year		<u>\$326,570,672</u>	<u>\$334,004,012</u>	<u>\$377,401,017</u>	<u>\$234,314,501</u>	<u>\$409,225,242</u>	<u>\$306,989,885</u>
Recreational Total WSB Expenditures per year:		\$436,079,925	\$457,277,829	\$508,799,171	\$312,784,607	\$603,195,741	\$439,176,374
<b>TOTAL RECREATIONAL WSB ANGLING ECONOMIC IMPACTS PER YEAR</b>							
<b>Employment Impacts of Recreational WSB Fishery by Mode</b>							
Employment Impacts of Shore WSB Fishing Trips by year		455	358	570	352	352	352
Employment Impacts of Private Boat WSB Fishing Trips by year		431	583	484	305	305	305
Employment Impacts of Far-Hire WSB Fishing Trips by Year		213	368	289	122	122	122
Employment Impacts of Durable Eqpt Purchases for WSB by Year		<u>2,756</u>	<u>2,608</u>	<u>3,083</u>	<u>1,902</u>	<u>1,902</u>	<u>1,902</u>
Total Employment Impacts of Recreational WSB Fishery:		3,854	3,918	4,425	2,682	6,446	4,425
<b>Sales Impacts of Recreational WSB Fishery by Mode</b>							
Sales Impacts of Shore WSB Fishing Trips by Year (\$000)		\$57,345,959	\$38,315,409	\$63,255,720	\$39,310,662	\$39,310,662	\$39,310,662
Sales Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$62,368,708	\$67,383,442	\$60,804,301	\$38,614,207	\$38,614,207	\$38,614,207
Sales Impacts of Far-Hire WSB Fishing Trips by Year (\$000)		\$24,810,328	\$40,995,147	\$33,790,133	\$14,325,917	\$14,325,917	\$14,325,917
Sales Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		<u>\$328,203,540</u>	<u>\$280,897,204</u>	<u>\$317,394,063</u>	<u>\$197,058,376</u>	<u>\$197,058,376</u>	<u>\$197,058,376</u>
Total Sales Impacts of Recreational WSB Fishery:		\$472,728,535	\$427,591,202	\$475,244,216	\$289,309,161	\$716,985,632	\$478,095,488
<b>Income Impacts of Recreational WSB Fishery by Mode</b>							
Income Impacts of Shore WSB Fishing Trips by Year (\$000)		\$20,878,254	\$16,146,770	\$26,657,045	\$16,566,187	\$16,566,187	\$16,566,187
Income Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$23,024,440	\$30,484,455	\$27,508,034	\$17,469,174	\$17,469,174	\$17,469,174
Income Impacts of Far-Hire WSB Fishing Trips by Year (\$000)		\$11,922,305	\$20,224,978	\$16,670,380	\$7,067,699	\$7,067,699	\$7,067,699
Income Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		<u>\$148,916,507</u>	<u>\$130,261,349</u>	<u>\$147,186,153</u>	<u>\$91,382,504</u>	<u>\$91,382,504</u>	<u>\$91,382,504</u>
Total Income Impacts of Recreational WSB Fishery:		\$204,741,506	\$197,117,552	\$218,021,611	\$132,485,563	\$328,290,971	\$219,329,652
<b>Value Added Impacts of Recreational WSB Fishery by Mode</b>							
Value Added Impacts of Shore WSB Fishing Trips by Year (\$000)		\$33,823,304	\$24,766,075	\$40,886,838	\$25,409,381	\$25,409,381	\$25,409,381
Value Added Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$38,190,566	\$44,830,286	\$40,453,175	\$25,690,078	\$25,690,078	\$25,690,078
Value Added Impacts of Far-Hire WSB Fishing Trips by Year (\$000)		\$17,505,937	\$26,123,693	\$21,532,379	\$9,129,028	\$9,129,028	\$9,129,028
Value Added Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		<u>\$229,252,559</u>	<u>\$192,386,057</u>	<u>\$217,382,699</u>	<u>\$134,964,974</u>	<u>\$134,964,974</u>	<u>\$134,964,974</u>
Total Value Added Impacts of Recreational WSB Fishery:		\$318,772,366	\$288,106,111	\$320,255,091	\$195,193,461	\$483,969,245	\$322,176,491
<b>RECREATIONAL WSB ANGLER EXPENDITURES AND IMPACTS PER FISH</b>							
Recreational WSB Angler Expenditures per Fish Caught:		\$318.90	\$229.79	\$241.88	\$185.78	\$106.82	\$208.78
Recreational WSB Angling Sales Impact per Fish Caught:		\$345.70	\$214.87	\$225.92	\$171.84	\$126.97	\$227.28
Recreational WSB Angling Income Impact per Fish Caught:		\$149.73	\$99.06	\$103.64	\$78.69	\$58.14	\$104.27
Recreational WSB Angling Value Added Impact per Fish Caught:		\$233.12	\$144.78	\$152.25	\$115.94	\$85.71	\$153.16

TABLE TWO: ABSOLUTE AND PERCENTAGE LOSSES IN MA SALES AND ECONOMIC IMPACT DUE TO DECLINING RECREATIONAL STRIPED BASS TRIPS FROM 2007 AND 2014 TO 2015

<b>WSB Expenditure Declines from 2007 to 2015</b> \$290,411,134 <b>Percent Increase in 2015 WSB Expenditures with 2007 Trips</b> 92.8%	<b>WSB Expenditure Declines from 2014 to 2015</b> \$126,391,767 <b>Percent Increase in 2015 WSB Expenditures with 2014 Trips</b> 40.4%
<b>Declines in WSB Employment Impact from 2007 to 2015</b> 3,964 <b>% Increase in 2015 WSB Employment Impact with 2007 Trips</b> 147.8%	<b>Declines in WSB Employment Impact from 2007 to 2015</b> 1,744 <b>% Increase in 2015 WSB Employment Impact with 2014 Trips</b> 65.0%
<b>Declines in WSB Sales Impact from 2007 to 2015</b> \$427,676,471 <b>Percent Increase in 2015 WSB Sales Impact with 2007 Trips</b> 147.8%	<b>Declines in WSB Sales Impact from 2007 to 2015</b> \$188,786,327 <b>Percent Increase in 2015 Sales Impact with 2014 Trips</b> 65.3%
<b>Declines in WSB Income Impact from 2007 to 2015</b> \$195,805,408 <b>Percent Increase in 2015 WSB Income Impact with 2007 Trips</b> 147.8%	<b>Declines in WSB Income Impact from 2007 to 2015</b> \$86,844,089 <b>Percent Increase in 2015 Income Impact with 2014 Trips</b> 65.5%
<b>Declines in WSB Value Added Impact from 2007 to 2015</b> \$288,775,783 <b>Percent Increase in 2015 WSB Impact with 2007 Trips</b> 147.9%	<b>Declines in WSB Value Added Impact from 2007 to 2015</b> \$126,983,030 <b>% Increase in 2015 WSB Economic Impact with 2014 Trips</b> 65.1%

TABLE THREE: SUMMARY COMPARISONS OF MA RECREATIONAL WSB FISHERY WITH MA COMMERCIAL WSB, FINFISH AND TOTAL FISHERIES

Year:	2006	2007	2008	2009	2010	2011
<b>Comparisons of Recreational Direct Trip Expenditures with the Value of Commercial Landings</b>						
Total Recreational WSB Direct Expenditures / Commercial WSB Landings	146.4	180.9	131.3	128.8	97.3	122.7
Total Recreational WSB Direct Expenditures / Commercial Finfish Landings	183.7%	454.6%	383.5%	342.0%	274.8%	295.3%
Total Recreational WSB Direct Expenditures / All Commercial Seafood Landings	79.0%	118.1%	116.6%	97.3%	72.5%	68.4%
<b>Comparisons of Recreational and Commercial Economic Impacts</b>						
<b>Employment Impact Comparisons</b>						
Employment Impacts of Recreational WSB Fishery / Commercial WSB Fishery	14.3	12.2	9.0	9.0	6.3	9.9
Employment Impacts of Recreational WSB Fishery / Commercial Finfish Industry	18.0%	30.6%	26.3%	23.9%	17.7%	23.9%
Employment Impacts of Recreational WSB Fishery / Commercial Seafood Industry	7.7%	8.0%	8.0%	6.8%	4.7%	5.5%
<b>Sales Impact Comparisons</b>						
Sales Impacts of Recreational WSB Fishery / Commercial WSB Fishery	40.0	44.5	32.1	31.7	23.2	32.2
Sales Impacts of Recreational WSB Fishery / Commercial Finfish Industry	50.1%	111.7%	93.9%	84.1%	65.5%	77.5%
Sales Impacts of Recreational WSB Fishery / Commercial Seafood Industry	21.6%	29.0%	28.5%	23.9%	17.3%	17.9%
<b>Income Impact Comparisons</b>						
Income Impacts of Recreational WSB Fishery / Commercial WSB Fishery	n.a.	n.a.	n.a.	30.1	22.0	37.8
Income Impacts of Recreational WSB Fishery / Commercial Finfish Industry	n.a.	n.a.	n.a.	80.0%	62.0%	90.9%
Income Impacts of Recreational WSB Fishery / Commercial Seafood Industry	n.a.	n.a.	n.a.	22.8%	16.4%	21.0%
<b>Value Added Impact Comparisons</b>						
Value Added Impacts of Recreational WSB Fishery / Commercial WSB Fishery	n.a.	48.2	34.9	34.4	24.9	43.2
Value Added Impacts of Recreational WSB Fishery / Commercial Finfish Industry	n.a.	121.0%	101.9%	91.2%	70.4%	103.9%
Value Added Impacts of Recreational WSB Fishery / Commercial Seafood Industry	n.a.	31.4%	31.0%	26.0%	18.6%	24.1%

Year (continued):	2012	2013	2014	
<b>Comparisons of Recreational Direct Trip Expenditures with the Value of Commercial Landings</b>				
Total Recreational WSB Direct Expenditures / Commercial WSB Landings	124.4	146.1	105.2	Average 2006-2014 131.5
Total Recreational WSB Direct Expenditures / Commercial Finfish Landings	345.8%	487.0%	485.2%	361.3%
Total Recreational WSB Direct Expenditures / All Commercial Seafood Landings	70.7%	80.8%	96.9%	88.9%
<b>Comparisons of Recreational and Commercial Economic Impacts</b>				
<b>Employment Impact Comparisons</b>				
Employment Impacts of Recreational WSB Fishery / Commercial WSB Fishery	9.9	11.0	8.5	Average 2006-2014 10.0
Employment Impacts of Recreational WSB Fishery / Commercial Finfish Industry	27.5%	36.7%	39.3%	27.1%
Employment Impacts of Recreational WSB Fishery / Commercial Seafood Industry	5.6%	6.1%	7.8%	6.7%
<b>Sales Impact Comparisons</b>				
Sales Impacts of Recreational WSB Fishery / Commercial WSB Fishery	32.0	32.7	23.4	Average 2006-2014 32.4
Sales Impacts of Recreational WSB Fishery / Commercial Finfish Industry	88.9%	108.9%	107.9%	87.6%
Sales Impacts of Recreational WSB Fishery / Commercial Seafood Industry	18.2%	18.1%	21.6%	21.8%
<b>Income Impact Comparisons</b>				
Income Impacts of Recreational WSB Fishery / Commercial WSB Fishery	37.5	40.7	29.2	Average 2009-2014 32.9
Income Impacts of Recreational WSB Fishery / Commercial Finfish Industry	104.1%	135.8%	134.5%	101.2%
Income Impacts of Recreational WSB Fishery / Commercial Seafood Industry	21.3%	22.5%	26.9%	21.8%
<b>Value Added Impact Comparisons</b>				
Value Added Impacts of Recreational WSB Fishery / Commercial WSB Fishery	42.8	43.7	31.4	Average 2007-2014 37.9
Value Added Impacts of Recreational WSB Fishery / Commercial Finfish Industry	119.1%	145.8%	144.9%	112.3%
Value Added Impacts of Recreational WSB Fishery / Commercial Seafood Industry	24.4%	24.2%	28.9%	26.1%

TABLE ONE: REVENUE IMPACT OF DECLINING WILD STRIPED BASS RECREATIONAL FISHING TRIPS COMPARED TO THE COMMERCIAL FISHERY IN MA FROM 2006-2011

Year:	2006	2007	2008	2009	2010	2011
Recreational Catch of WSB in MA, 2000-2015	8,124,766	5,646,880	4,027,374	2,627,003	2,012,483	1,228,699
% of WSB Caught relative to Peak Year in 2006	100.0%	69.5%	49.6%	32.3%	24.8%	15.1%
% of WSB Catch Shortfall relative to Peak in 2006	0.0%	30.5%	50.4%	67.7%	75.2%	84.9%
Recreational WSB Fishing Trips in MA, 2000-2015	2,816,805	3,014,182	2,829,096	2,157,200	1,967,823	1,560,356
% of MA WSB Trips relative to Peak Year in 2007	93.5%	100.0%	93.9%	71.6%	65.3%	51.8%
% of MA WSB Trip Shortfall relative to Peak in 2007	6.5%	0.0%	6.1%	28.4%	34.7%	48.2%
CPI data for Boston - Brockton area (1984=100)	223.1	227.4	235.4	233.8	237.4	243.9
Year:	2006	2007	2008	2009	2010	2011
<b>RECREATIONAL ANGLER EXPENDITURES PER TRIP</b>						
Recreational Shore Fishing Expenditures per trip per year	\$77.33	\$78.36	\$74.02	\$79.47	\$76.97	\$52.69
Recreational Pvt Boat Fishing Expenditures per trip per year	\$30.25	\$30.25	\$31.64	\$34.29	\$34.35	\$58.85
Recreational For-Hire Fishing Expenditures per trip per year	\$149.65	\$151.45	\$139.27	\$147.13	\$152.46	\$274.06
Total Recreational Direct Trip Expenditures per trip per year	\$56.19	\$56.66	\$55.78	\$61.13	\$54.07	\$70.48
Recreational Durable Equipment Expenses per trip per year	\$112.26	\$110.52	\$111.37	\$121.71	\$125.66	\$186.15
Total Recreational Trip and Equipment Expenditures per trip per year:	\$168.44	\$167.18	\$167.16	\$182.84	\$179.73	\$256.63
Average of above (assumes 50% durable eqpt expenses scaled upward)	\$112.31	\$111.92	\$111.47	\$121.99	\$116.90	\$163.55
<b>RECREATIONAL ANGLING ECONOMIC IMPACTS PER TRIP</b>						
<b>Employment Impacts per Recreational Trip by Mode</b>						
Employment Impacts per Trip of Shore Fishing Trips by year	0.0011	0.0011	0.0010	0.0011	0.0011	0.0006
Employment Impacts per Trip of Private Boat Fishing Trips by year	0.0003	0.0003	0.0003	0.0003	0.0003	0.0005
Employment Impacts per Trip of For-Hire Fishing Trips by Year	0.0023	0.0024	0.0022	0.0023	0.0024	0.0039
Employment Impacts per Trip of Durable Eqpt Purchases by Year	0.0006	0.0006	0.0006	0.0007	0.0007	0.0016
Total Employment Impacts per Recreational Angling Trip:	0.0013	0.0013	0.0013	0.0014	0.0013	0.0023
<b>Sales Impacts per Recreational Trip by Mode</b>						
Sales Impacts per Trip of Shore Fishing Trips by year	\$111.03	\$112.51	\$106.28	\$114.10	\$110.51	\$76.57
Sales Impacts per Trip of Private Boat Fishing Trips by year	\$33.83	\$33.83	\$35.38	\$38.35	\$38.42	\$66.80
Sales Impacts per Trip of For-Hire Fishing Trips by Year	\$226.01	\$228.73	\$210.32	\$222.19	\$230.24	\$450.51
Sales Impacts per Trip of Durable Eqpt Purchases by Year	\$99.07	\$97.54	\$98.29	\$107.42	\$110.91	\$187.02
Total Sales Impacts per Recreational Angling Trip:	\$175.25	\$174.39	\$173.78	\$190.40	\$182.33	\$284.19
<b>Income Impacts per Recreational Trip by Mode</b>						
Income Impacts per Trip of Shore Fishing Trips by year	n.a.	n.a.	n.a.	\$40.84	\$39.55	\$27.87
Income Impacts per Trip of Private Boat Fishing Trips by year	n.a.	n.a.	n.a.	\$14.04	\$14.07	\$24.68
Income Impacts per Trip of For-Hire Fishing Trips by Year	n.a.	n.a.	n.a.	\$77.90	\$80.72	\$216.52
Income Impacts per Trip of Durable Eqpt Purchases by Year	n.a.	n.a.	n.a.	\$36.64	\$37.83	\$84.80
Total Income Impacts per Recreational Angling Trip:	n.a.	n.a.	n.a.	\$66.39	\$63.51	\$123.87
<b>Value Added Impacts per Recreational Trip by Mode</b>						
Value Added Impacts per Trip of Shore Fishing Trips by year	\$65.74	\$66.61	\$62.93	\$67.56	\$65.43	\$45.17
Value Added Impacts per Trip of Private Boat Fishing Trips by year	\$20.74	\$20.74	\$21.69	\$23.51	\$23.55	\$40.88
Value Added Impacts per Trip of For-Hire Fishing Trips by Year	\$134.84	\$136.46	\$125.48	\$132.57	\$137.36	\$317.87
Value Added Impacts per Trip of Durable Eqpt Purchases by Year	\$49.79	\$49.02	\$49.39	\$53.98	\$55.73	\$130.72
Total Value Added Impacts per Recreational Angling Trip:	\$95.32	\$94.94	\$94.53	\$103.59	\$98.56	\$192.24
<b>TOTAL RECREATIONAL WSB ANGLER EXPENDITURES PER YEAR</b>						
Recreational Shore Fishing WSB Trip Expenditures	\$88,956,652	\$103,050,215	\$90,406,147	\$75,976,979	\$51,118,139	\$38,924,693
Recreational Private Boat WSB Trip Expenditures	\$48,502,022	\$49,316,302	\$47,971,391	\$38,134,851	\$43,695,473	\$44,775,621
Recreational For-Hire Fishing WSB Trip Expenditures	\$9,438,590	\$10,444,595	\$12,743,113	\$13,093,925	\$4,835,781	\$16,639,503
Recreational Direct WSB Trip Expenditures per year	\$146,897,264	\$162,811,112	\$151,120,651	\$127,205,754	\$99,649,394	\$100,339,817
Recreational Durable Equipment WSB Expenditures per year	\$316,204,302	\$333,138,180	\$315,085,099	\$262,549,561	\$247,286,393	\$290,464,255
Recreational Total WSB Expenditures per year:	\$463,101,566	\$495,949,291	\$466,205,750	\$389,755,315	\$346,935,787	\$390,804,072
<b>TOTAL RECREATIONAL WSB ANGLING ECONOMIC IMPACTS PER YEAR</b>						
<b>Employment Impacts of Recreational WSB Fishery by Mode</b>						
Employment Impacts of Shore WSB Fishing Trips by year	1,238	1,435	1,258	1,058	711	449
Employment Impacts of Private Boat WSB Fishing Trips by year	464	472	458	365	417	351
Employment Impacts of For-Hire WSB Fishing Trips by Year	148	164	200	205	76	234
Employment Impacts of Durable Eqpt Purchases for WSB by Year	1,695	1,786	1,689	1,407	1,326	2,450
Total Employment Impacts of Recreational WSB Fishery:	3,545	3,856	3,606	3,035	2,531	3,485
<b>Sales Impacts of Recreational WSB Fishery by Mode</b>						
Sales Impacts of Shore WSB Fishing Trips by Year (\$000)	\$127,722,642	\$147,957,887	\$129,803,551	\$109,086,751	\$73,394,550	\$56,568,706
Sales Impacts of Private Boat WSB Fishing Trips by Year (\$000)	\$54,241,745	\$55,152,602	\$53,648,041	\$42,648,516	\$48,866,626	\$50,827,253
Sales Impacts of For-Hire WSB Fishing Trips by Year (\$000)	\$14,254,789	\$15,774,114	\$19,245,053	\$19,774,597	\$7,303,105	\$27,352,651
Sales Impacts of Durable Eqpt Purchases for WSB by Year (\$000)	\$279,071,458	\$294,016,811	\$278,083,532	\$231,717,351	\$218,246,758	\$291,821,920
Total Sales Impacts of Recreational WSB Fishery:	\$475,290,633	\$512,901,413	\$480,780,177	\$403,227,215	\$347,811,038	\$426,570,531
<b>Income Impacts of Recreational WSB Fishery by Mode</b>						
Income Impacts of Shore WSB Fishing Trips by Year (\$000)	n.a.	n.a.	n.a.	\$39,040,284	\$26,266,875	\$20,593,642
Income Impacts of Private Boat WSB Fishing Trips by Year (\$000)	n.a.	n.a.	n.a.	\$15,617,713	\$17,894,771	\$18,776,910
Income Impacts of For-Hire WSB Fishing Trips by Year (\$000)	n.a.	n.a.	n.a.	\$6,932,514	\$2,560,228	\$13,146,134
Income Impacts of Durable Eqpt Purchases for WSB by Year (\$000)	n.a.	n.a.	n.a.	\$29,040,518	\$24,445,577	\$132,311,298
Total Income Impacts of Recreational WSB Fishery:	n.a.	n.a.	n.a.	\$140,631,029	\$121,167,451	\$184,827,983
<b>Value Added Impacts of Recreational WSB Fishery by Mode</b>						
Value Added Impacts of Shore WSB Fishing Trips by Year (\$000)	\$75,622,624	\$87,603,791	\$76,854,625	\$64,588,472	\$43,455,708	\$33,368,955
Value Added Impacts of Private Boat WSB Fishing Trips by Year (\$000)	\$33,256,610	\$33,814,736	\$32,892,667	\$26,148,547	\$29,960,597	\$31,105,208
Value Added Impacts of For-Hire WSB Fishing Trips by Year (\$000)	\$8,504,544	\$9,411,020	\$11,481,660	\$11,797,996	\$4,357,074	\$19,299,759
Value Added Impacts of Durable Eqpt Purchases for WSB by Year (\$000)	\$140,239,105	\$147,749,301	\$139,743,036	\$116,442,922	\$109,673,265	\$203,975,804
Total Value Added Impacts of Recreational WSB Fishery:	\$257,622,883	\$278,578,848	\$260,971,989	\$218,977,936	\$187,446,645	\$287,749,725
<b>RECREATIONAL WSB ANGLER EXPENDITURES AND IMPACTS PER FISH</b>						
Recreational WSB Angler Expenditures per Fish Caught:	\$57.00	\$87.83	\$115.76	\$148.37	\$172.39	\$318.06
Recreational WSB Angling Sales Impact per Fish Caught:	\$58.50	\$90.83	\$119.38	\$153.49	\$172.83	\$347.17
Recreational WSB Angling Income Impact per Fish Caught:	n.a.	n.a.	n.a.	\$53.53	\$60.21	\$150.43
Recreational WSB Angling Value Added Impact per Fish Caught:	\$31.71	\$49.33	\$64.80	\$83.36	\$93.14	\$234.19

TABLE ONE: REVENUE IMPACT OF DECLINING WILD STRIPED BASS RECREATIONAL FISHING TRIPS COMPARED TO THE COMMERCIAL FISHERY IN MA FROM 2006 TO 2017 (continued)

	Year (continued):	2012	2013	2014	2015	2016	2017 (preliminary)
Recreational Catch of WSB in MA, 2000-2015		1,367,440	1,989,972	2,103,549	1,716,864	2,356,558	3,262,178
% of WSB Caught relative to Peak Year in 2006		16.8%	24.5%	25.9%	21.1%	29.0%	40.2%
% of WSB Catch Shortfall relative to Peak in 2006		83.2%	75.5%	74.1%	78.9%	71.0%	59.8%
Recreational WSB Fishing Trips in MA, 2000-2015		1,650,954	1,761,750	1,959,099	1,240,859	1,317,160	858,360
% of MA WSB Trips relative to Peak Year in 2007		54.8%	58.4%	65.0%	41.2%	43.7%	28.5%
% of MA WSB Trip Shortfall relative to Peak in 2007		45.2%	41.6%	35.0%	58.8%	56.3%	71.5%
CPI data for Boston - Brockton area (1984=100)		247.7	251.1	255.2	256.7	260.5	267.0
Year:		2012	2013	2014	2015	2016	2017 (preliminary)
RECREATIONAL ANGLER EXPENDITURES PER TRIP							
Total Recreational Direct Trip Expenditures per trip per year		\$74.13	\$77.08	\$78.32	\$78.79	\$79.96	\$81.96
Recreational Durable Equipment Expenses per trip per year		\$197.81	\$189.59	\$192.64	\$193.80	\$196.65	\$201.58
Total Recreational Trip and Equipment Expenditures per trip per year:		\$271.94	\$266.67	\$270.96	\$272.59	\$276.61	\$283.53
Average of above (assumes 50% durable eqpt expenses scaled upward)		\$173.03	\$171.88	\$174.64	\$175.69	\$178.28	\$182.75
RECREATIONAL ANGLING ECONOMIC IMPACTS PER TRIP							
Employment Impacts per Recreational Trip by Mode							
Employment Impacts per Trip of Shore Fishing Trips by year		0.0007	0.0007	0.0008	0.0006	0.0007	0.0007
Employment Impacts per Trip of Private Boat Fishing Trips by year		0.0005	0.0005	0.0005	0.0004	0.0005	0.0005
Employment Impacts per Trip of For-Hire Fishing Trips by Year		0.0038	0.0040	0.0040	0.0038	0.0039	0.0039
Employment Impacts per Trip of Durable Eqpt Purchases by Year		0.0017	0.0015	0.0033	0.0035	0.0034	0.0034
Total Employment Impacts per Recreational Angling Trip:		0.0025	0.0024	0.0042	0.0042	0.0042	0.0042
Sales Impacts per Recreational Trip by Mode							
Sales Impacts per Trip of Shore Fishing Trips by year		\$84.00	\$70.28	\$71.41	\$71.84	\$72.90	\$74.72
Sales Impacts per Trip of Private Boat Fishing Trips by year		\$68.41	\$59.92	\$60.89	\$61.25	\$62.15	\$63.71
Sales Impacts per Trip of For-Hire Fishing Trips by Year		\$438.97	\$445.48	\$452.65	\$455.37	\$462.08	\$473.65
Sales Impacts per Trip of Durable Eqpt Purchases by Year		\$198.80	\$159.44	\$162.01	\$162.98	\$165.38	\$169.52
Total Sales Impacts per Recreational Angling Trip:		\$300.20	\$257.09	\$261.23	\$262.80	\$266.67	\$273.34
Income Impacts per Recreational Trip by Mode							
Income Impacts per Trip of Shore Fishing Trips by year		\$30.58	\$29.62	\$30.09	\$30.27	\$30.72	\$31.49
Income Impacts per Trip of Private Boat Fishing Trips by year		\$25.25	\$27.11	\$27.55	\$27.71	\$28.12	\$28.82
Income Impacts per Trip of For-Hire Fishing Trips by Year		\$210.94	\$219.78	\$223.32	\$224.66	\$227.97	\$233.67
Income Impacts per Trip of Durable Eqpt Purchases by Year		\$90.20	\$73.94	\$75.13	\$75.58	\$76.69	\$78.61
Total Income Impacts per Recreational Angling Trip:		\$130.97	\$118.94	\$120.85	\$121.58	\$123.37	\$126.46
Value Added Impacts per Recreational Trip by Mode							
Value Added Impacts per Trip of Shore Fishing Trips by year		\$49.54	\$45.43	\$46.16	\$46.44	\$47.12	\$48.30
Value Added Impacts per Trip of Private Boat Fishing Trips by year		\$41.89	\$39.87	\$40.51	\$40.75	\$41.35	\$42.39
Value Added Impacts per Trip of For-Hire Fishing Trips by Year		\$309.74	\$283.88	\$288.45	\$290.18	\$294.45	\$301.83
Value Added Impacts per Trip of Durable Eqpt Purchases by Year		\$138.86	\$109.20	\$110.96	\$111.63	\$113.27	\$116.11
Total Value Added Impacts per Recreational Angling Trip:		\$203.12	\$172.58	\$175.36	\$176.42	\$179.01	\$183.50
TOTAL RECREATIONAL WSB ANGLER EXPENDITURES PER YEAR							
Recreational Shore Fishing WSB Trip Expenditures		\$39,467,342	\$29,518,853	\$48,733,300	\$30,669,166	\$25,646,438	\$17,587,445
Recreational Private Boat WSB Trip Expenditures		\$54,950,548	\$68,969,563	\$62,235,558	\$39,939,732	\$52,690,249	\$32,076,810
Recreational For-Hire Fishing WSB Trip Expenditures		\$15,091,363	\$24,785,401	\$20,429,296	\$13,673,160	\$9,012,419	\$17,454,798
Recreational Direct WSB Trip Expenditures per year		\$109,509,253	\$123,273,818	\$131,398,154	\$84,282,059	\$87,349,106	\$67,119,053
Recreational Durable Equipment WSB Expenditures per year		\$326,570,672	\$334,004,012	\$377,401,017	\$240,473,333	\$259,019,723	\$173,024,063
Recreational Total WSB Expenditures per year:		\$436,079,925	\$457,277,829	\$508,799,171	\$324,755,392	\$346,368,829	\$240,143,116
TOTAL RECREATIONAL WSB ANGLING ECONOMIC IMPACTS PER YEAR							
Employment Impacts of Recreational WSB Fishery by Mode							
Employment Impacts of Shore WSB Fishing Trips by year		455	358	737	340	330	221
Employment Impacts of Private Boat WSB Fishing Trips by year		431	583	524	260	386	229
Employment Impacts of For-Hire WSB Fishing Trips by Year		213	368	299	186	125	236
Employment Impacts of Durable Eqpt Purchases for WSB by Year		2,756	2,608	6,429	4,368	4,479	2,919
Total Employment Impacts of Recreational WSB Fishery:		3,854	3,918	7,988	5,154	5,321	3,606
Sales Impacts of Recreational WSB Fishery by Mode							
Sales Impacts of Shore WSB Fishing Trips by Year (\$000)		\$57,345,959	\$38,315,409	\$63,255,720	\$39,808,512	\$33,289,022	\$22,828,466
Sales Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$62,368,708	\$67,383,442	\$60,804,301	\$39,021,222	\$51,478,510	\$31,339,127
Sales Impacts of For-Hire WSB Fishing Trips by Year (\$000)		\$24,810,328	\$40,995,147	\$33,790,133	\$22,615,459	\$14,906,575	\$28,870,303
Sales Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		\$328,203,540	\$280,897,204	\$317,394,063	\$202,237,950	\$217,835,455	\$145,513,148
Total Sales Impacts of Recreational WSB Fishery:		\$472,728,535	\$427,591,202	\$475,244,216	\$303,683,144	\$317,509,562	\$228,551,044
Income Impacts of Recreational WSB Fishery by Mode							
Income Impacts of Shore WSB Fishing Trips by Year (\$000)		\$20,878,254	\$16,146,770	\$26,657,045	\$16,775,989	\$14,028,564	\$9,620,307
Income Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$23,024,440	\$30,484,455	\$27,508,034	\$17,653,309	\$23,289,020	\$14,177,908
Income Impacts of For-Hire WSB Fishing Trips by Year (\$000)		\$11,922,305	\$20,224,978	\$16,670,380	\$11,157,349	\$7,354,167	\$14,243,180
Income Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		\$148,916,507	\$130,261,349	\$147,186,153	\$93,784,444	\$101,017,525	\$67,479,273
Total Income Impacts of Recreational WSB Fishery:		\$204,741,506	\$197,117,552	\$218,021,611	\$139,371,091	\$145,689,276	\$105,520,666
Value Added Impacts of Recreational WSB Fishery by Mode							
Value Added Impacts of Shore WSB Fishing Trips by Year (\$000)		\$33,823,304	\$24,766,075	\$40,886,838	\$25,731,178	\$21,517,150	\$14,755,721
Value Added Impacts of Private Boat WSB Fishing Trips by Year (\$000)		\$38,190,566	\$44,830,286	\$40,453,175	\$25,960,866	\$34,248,715	\$20,849,959
Value Added Impacts of For-Hire WSB Fishing Trips by Year (\$000)		\$17,505,937	\$26,123,693	\$21,532,379	\$14,411,445	\$9,499,046	\$18,397,274
Value Added Impacts of Durable Eqpt Purchases for WSB by Year (\$000)		\$229,252,559	\$192,386,057	\$217,382,699	\$138,512,457	\$149,195,163	\$99,661,728
Total Value Added Impacts of Recreational WSB Fishery:		\$318,772,366	\$288,106,111	\$320,255,091	\$204,615,946	\$214,460,075	\$153,664,682
RECREATIONAL WSB ANGLER EXPENDITURES AND IMPACTS PER FISH							
Recreational WSB Angler Expenditures per Fish Caught:		\$318.90	\$229.79	\$241.88	\$189.16	\$146.98	\$73.61
Recreational WSB Angling Sales Impact per Fish Caught:		\$345.70	\$214.87	\$225.92	\$176.88	\$134.73	\$70.06
Recreational WSB Angling Income Impact per Fish Caught:		\$149.73	\$99.06	\$103.64	\$81.18	\$61.82	\$32.35
Recreational WSB Angling Value Added Impact per Fish Caught:		\$233.12	\$144.78	\$152.25	\$119.18	\$91.01	\$47.10

TABLE TWO: ABSOLUTE AND PERCENTAGE LOSSES IN MA SALES AND ECONOMIC IMPACT DUE TO DECLINING RECREATIONAL STRIPED BASS TRIPS FROM 2007 TO 2016

<b>WSB Expenditure Declines from 2007 to 2016</b>
\$276,338,090
<b>Percent Increase in 2016 WSB Expenditures with 2007 Trips</b>
79.8%
<b>Declines in WSB Employment Impact from 2007 to 2016</b>
6,908
<b>% Increase in 2016 WSB Employment Impact with 2007 Trips</b>
129.8%
<b>Declines in WSB Sales Impact from 2007 to 2016</b>
\$410,036,118
<b>Percent Increase in 2016 WSB Sales Impact with 2007 Trips</b>
129.1%
<b>Declines in WSB Income Impact from 2007 to 2016</b>
\$187,436,895
<b>Percent Increase in 2016 WSB Income Impact with 2007 Trips</b>
128.7%
<b>Declines in WSB Value Added Impact from 2007 to 2016</b>
\$276,637,260
<b>Percent Increase in 2016 WSB Impact with 2007 Trips</b>
129.0%

TABLE THREE: SUMMARY COMPARISONS OF MA RECREATIONAL WSB FISHERY WITH MA COMMERCIAL WSB, FINFISH AND TOTAL FISHERIES

Year:	2006	2007	2008	2009	2010	2011
<b>Comparisons of Recreational Direct Trip Expenditures with the Value of Commercial Landings</b>						
Total Recreational WSB Direct Expenditures / Commercial WSB Landings	146.4	180.9	131.3	128.8	97.3	122.7
Total Recreational WSB Direct Expenditures / Commercial Finfish Landings	183.7%	454.6%	383.5%	342.0%	274.8%	295.3%
Total Recreational WSB Direct Expenditures / All Commercial Seafood Landings	79.0%	118.1%	116.6%	97.3%	72.5%	68.4%
<b>Comparisons of Recreational and Commercial Economic Impacts</b>						
<b>Employment Impact Comparisons</b>						
Employment Impacts of Recreational WSB Fishery / Commercial WSB Fishery	14.3	12.2	9.0	9.0	6.3	9.9
Employment Impacts of Recreational WSB Fishery / Commercial Finfish Industry	18.0%	30.6%	26.3%	23.9%	17.7%	23.9%
Employment Impacts of Recreational WSB Fishery / Commercial Seafood Industry	7.7%	8.0%	8.0%	6.8%	4.7%	5.5%
<b>Sales Impact Comparisons</b>						
Sales Impacts of Recreational WSB Fishery / Commercial WSB Fishery	40.0	44.5	32.1	31.7	23.2	32.2
Sales Impacts of Recreational WSB Fishery / Commercial Finfish Industry	50.1%	111.7%	93.9%	84.1%	65.5%	77.5%
Sales Impacts of Recreational WSB Fishery / Commercial Seafood Industry	21.6%	29.0%	28.5%	23.9%	17.3%	17.9%
<b>Income Impact Comparisons</b>						
Income Impacts of Recreational WSB Fishery / Commercial WSB Fishery	n.a.	n.a.	n.a.	30.1	22.0	37.8
Income Impacts of Recreational WSB Fishery / Commercial Finfish Industry	n.a.	n.a.	n.a.	80.0%	62.0%	90.9%
Income Impacts of Recreational WSB Fishery / Commercial Seafood Industry	n.a.	n.a.	n.a.	22.8%	16.4%	21.0%
<b>Value Added Impact Comparisons</b>						
Value Added Impacts of Recreational WSB Fishery / Commercial WSB Fishery	n.a.	48.2	34.9	34.4	24.9	43.2
Value Added Impacts of Recreational WSB Fishery / Commercial Finfish Industry	n.a.	121.0%	101.9%	91.2%	70.4%	103.9%
Value Added Impacts of Recreational WSB Fishery / Commercial Seafood Industry	n.a.	31.4%	31.0%	26.0%	18.6%	24.1%
<b>Year (continued):</b>						
	2012	2013	2014	2015	2016	
<b>Comparisons of Recreational Direct Trip Expenditures with the Value of Commercial Landings</b>						
Total Recreational WSB Direct Expenditures / Commercial WSB Landings	124.4	146.1	105.3	90.9	90.9	Average 2006-2016 124.1
Total Recreational WSB Direct Expenditures / Commercial Finfish Landings	345.8%	487.0%	491.3%	327.8%	349.7%	357.8%
Total Recreational WSB Direct Expenditures / All Commercial Seafood Landings	70.7%	80.8%	97.2%	62.0%	62.9%	84.1%
<b>Comparisons of Recreational and Commercial Economic Impacts</b>						
<b>Employment Impact Comparisons</b>						
Employment Impacts of Recreational WSB Fishery / Commercial WSB Fishery	9.9	11.0	14.6	14.4		Average 2006-2015 11.1
Employment Impacts of Recreational WSB Fishery / Commercial Finfish Industry	27.5%	36.7%	68.0%	51.7%		32.4%
Employment Impacts of Recreational WSB Fishery / Commercial Seafood Industry	5.6%	6.1%	13.5%	9.8%		7.6%
<b>Sales Impact Comparisons</b>						
Sales Impacts of Recreational WSB Fishery / Commercial WSB Fishery	32.0	32.7	23.3	20.2		Average 2006-2015 31.2
Sales Impacts of Recreational WSB Fishery / Commercial Finfish Industry	88.9%	108.9%	108.7%	72.7%		86.2%
Sales Impacts of Recreational WSB Fishery / Commercial Seafood Industry	18.2%	18.1%	21.5%	13.7%		21.0%
<b>Income Impact Comparisons</b>						
Income Impacts of Recreational WSB Fishery / Commercial WSB Fishery	37.5	40.7	29.1	25.2		Average 2009-2015 22.2
Income Impacts of Recreational WSB Fishery / Commercial Finfish Industry	104.1%	135.8%	135.7%	91.0%		69.9%
Income Impacts of Recreational WSB Fishery / Commercial Seafood Industry	21.3%	22.5%	26.9%	17.2%		14.8%
<b>Value Added Impact Comparisons</b>						
Value Added Impacts of Recreational WSB Fishery / Commercial WSB Fishery	42.8	43.7	31.3	27.2		Average 2007-2015 33.1
Value Added Impacts of Recreational WSB Fishery / Commercial Finfish Industry	119.1%	145.8%	146.1%	97.9%		99.7%
Value Added Impacts of Recreational WSB Fishery / Commercial Seafood Industry	24.4%	24.2%	28.9%	18.5%		22.7%

## National Marine Fisheries Service

EXHIBIT THREE (page 1 of 2)

## Annual Landings by Species for Massachusetts as of 08-DEC-17

Year	AFS Species Name	Pounds	Dollars	Price_Pound
2000	BASS, STRIPED	796,159	\$2,289,730	\$2.88
2000	ALL FINFISH	130,094,582	\$120,594,888	\$0.93
2000	SCALLOP, SEA	16,174,736	\$85,293,917	\$5.27
2000	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	58,936,537	\$170,355,551	\$2.89
2000	ALL SEAFOOD	189,031,119	\$290,950,439	\$1.54
2001	BASS, STRIPED	815,384	\$1,849,868	\$2.27
2001	ALL FINFISH	182,473,220	\$122,944,339	\$0.67
2001	SCALLOP, SEA	22,639,894	\$87,356,514	\$3.86
2001	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	58,285,641	\$156,001,669	\$2.68
2001	ALL SEAFOOD	240,758,861	\$278,946,008	\$1.16
2002	BASS, STRIPED	924,885	\$1,673,905	\$1.81
2002	ALL FINFISH	175,304,852	\$122,693,498	\$0.70
2002	SCALLOP, SEA	25,289,857	\$100,551,005	\$3.98
2002	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	68,196,288	\$174,228,653	\$2.55
2002	ALL SEAFOOD	243,501,140	\$296,922,151	\$1.22
2003	BASS, STRIPED	1,055,496	\$1,819,354	\$1.72
2003	ALL FINFISH	231,978,322	\$116,766,810	\$0.50
2003	SCALLOP, SEA	25,371,251	\$106,938,232	\$4.21
2003	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	63,461,127	\$175,835,461	\$2.77
2003	ALL SEAFOOD	295,439,449	\$292,602,271	\$0.99
2004	BASS, STRIPED	1,212,846	\$2,002,487	\$1.65
2004	ALL FINFISH	267,297,885	\$109,161,784	\$0.41
2004	SCALLOP, SEA	27,943,583	\$144,747,979	\$5.18
2004	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	70,304,715	\$216,775,285	\$3.08
2004	ALL SEAFOOD	337,602,600	\$325,937,069	\$0.97
2005	BASS, STRIPED	1,099,942	\$2,306,486	\$2.10
2005	ALL FINFISH	267,311,261	\$117,002,968	\$0.44
2005	SCALLOP, SEA	29,045,450	\$226,948,917	\$7.81
2005	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	69,993,098	\$310,329,513	\$4.43
2005	ALL SEAFOOD	337,304,359	\$427,332,481	\$1.27
2006	BASS, STRIPED	1,322,291	\$3,163,669	\$2.39
2006	ALL FINFISH	304,510,411	\$252,170,517	\$0.83
2006	SCALLOP, SEA	36,666,479	\$234,796,388	\$6.40
2006	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	92,399,682	\$334,149,240	\$3.62
2006	ALL SEAFOOD	396,910,093	\$586,319,757	\$1.48
2007	BASS, STRIPED	1,039,337	\$2,741,321	\$2.64
2007	ALL FINFISH	227,208,096	\$109,089,257	\$0.48
2007	SCALLOP, SEA	32,539,791	\$218,291,874	\$6.71
2007	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	77,565,717	\$310,915,063	\$4.01
2007	ALL SEAFOOD	304,773,813	\$420,004,320	\$1.38
2008	BASS, STRIPED	1,160,360	\$3,551,660	\$3.06
2008	ALL FINFISH	255,603,154	\$121,567,219	\$0.48
2008	SCALLOP, SEA	27,011,294	\$189,891,395	\$7.03
2008	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	71,029,082	\$278,254,467	\$3.92
2008	ALL SEAFOOD	326,632,236	\$399,821,686	\$1.22

			<b><u>EXHIBIT THREE (page 2 of 2)</u></b>	
2009	BASS, STRIPED	1,134,279	\$3,024,907	\$2.67
2009	ALL FINFISH	278,908,409	\$113,972,752	\$0.41
2009	SCALLOP, SEA	29,781,721	\$197,280,495	\$6.62
2009	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	77,196,538	\$286,500,435	\$3.71
2009	ALL SEAFOOD	356,104,947	\$400,473,187	\$1.12
2010	BASS, STRIPED	1,221,209	\$3,567,426	\$2.92
2010	ALL FINFISH	200,843,970	\$126,261,509	\$0.63
2010	SCALLOP, SEA	31,155,917	\$252,253,367	\$8.10
2010	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	82,180,568	\$352,429,854	\$4.29
2010	ALL SEAFOOD	283,024,538	\$478,691,363	\$1.69
2011	BASS, STRIPED	1,162,429	\$3,183,749	\$2.74
2011	ALL FINFISH	179,716,782	\$132,330,128	\$0.74
2011	SCALLOP, SEA	33,091,859	\$330,943,531	\$10.00
2011	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	85,274,020	\$439,252,788	\$5.15
2011	ALL SEAFOOD	264,990,802	\$571,582,916	\$2.16
2012	BASS, STRIPED	1,218,485	\$3,504,686	\$2.88
2012	ALL FINFISH	193,449,025	\$126,107,939	\$0.65
2012	SCALLOP, SEA	36,725,267	\$364,863,812	\$9.93
2012	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	102,587,477	\$490,358,507	\$4.78
2012	ALL SEAFOOD	296,036,502	\$616,466,446	\$2.08
2013	BASS, STRIPED	1,004,468	\$3,130,000	\$3.12
2013	ALL FINFISH	163,900,255	\$93,898,466	\$0.57
2013	SCALLOP, SEA	29,287,337	\$334,205,322	\$11.41
2013	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	98,355,899	\$471,840,553	\$4.80
2013	ALL SEAFOOD	262,256,154	\$565,739,019	\$2.16
2014	BASS, STRIPED	1,138,518	\$4,832,063	\$4.24
2014	ALL FINFISH	181,642,842	\$103,558,065	\$0.57
2014	SCALLOP, SEA	21,392,034	\$271,373,414	\$12.69
2014	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	90,958,449	\$419,852,187	\$4.62
2014	ALL SEAFOOD	272,601,291	\$523,410,252	\$1.92
2015	BASS, STRIPED	865,760	\$3,570,775	\$4.12
2015	ALL FINFISH	169,256,903	\$99,081,995	\$0.59
2015	SCALLOP, SEA	21,514,646	\$264,933,400	\$12.31
2015	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	91,089,863	\$425,030,404	\$4.67
2015	ALL SEAFOOD	260,346,766	\$524,112,399	\$2.01
2016	BASS, STRIPED	938,230	\$3,812,285	\$4.06
2016	ALL FINFISH	147,462,942	\$99,034,024	\$0.67
2016	SCALLOP, SEA	22,867,292	\$281,444,674	\$12.31
2016	ALL SHELLFISH (INCL. SHRIMP, SQUID, ETC.)	96,755,303	\$451,720,892	\$4.67
2016	ALL SEAFOOD	244,218,245	\$550,754,916	\$2.26

**EXHIBIT 4**

# **The Economics of Recreational and Commercial Striped Bass Fishing in Massachusetts**

**Summer 2005**



**Prepared by Southwick Associates, Inc.**  
Fernandina Beach, Florida

**For:**

**Stripers Forever, Inc.**

## Executive Summary

### Economic Impacts:

This report assesses the economic contributions of commercial and recreational marine striped bass fishing in the estuarine and marine waters of Massachusetts, and aquaculture's potential as a substitute for wild fish. The contents were adapted from an Atlantic coast-wide study on the same topic (*The Economics of Recreational and Commercial Striped Bass Fishing*, March, 2005). This report presents results specific to Massachusetts while the original report contained results for all the Atlantic states from Maine to North Carolina.

The mission of Stripers Forever is as follows:

“Stripers Forever advocates eliminating all commercial fishing for wild striped bass, setting aside as much of the commercial quota as necessary to create and maintain healthier fish stocks, and allocating the rest to improve personal-use fishing for recreational anglers.”

If the striped bass fishery were so managed, any future harvest levels would produce greater returns for coastal economies and the national economy, because as this report explains, striped bass captured by the recreational sector are far more valuable on a per pound basis than those harvested commercially.

The purpose of this report is to help readers understand the greater economic returns from recreational fishing compared to commercial harvests, even when overall harvests are reduced. This report is based on data from existing sources and includes details regarding methods, limitations and results.

Currently, given state-specific allocations of striped bass between the commercial and recreational sectors, recreational anglers harvest 4.6 times more fish, yet produce nearly 50 times more economic activity than commercial fishermen as a result (see Table E-1, page v). The commercial impacts in Table E-1 considered the value-added and additional impacts created as raw striped bass move through processors and distributors on the way to the final restaurant or retail consumer. Detailed, state-specific impacts for the recreational and commercial fisheries are presented later in this report.

**Table E-1: Impacts of Recreationally Harvested Striped Bass Compared to Commercially Harvested Striped Bass in Massachusetts**

	Commercial	Recreational	Recreational Impacts Are:
<b><u>Total:</u></b>			
Pounds Harvested	1,055,496	4,889,036	4.6 times greater
Retail Sales (seafood retail and restaurants / angler expenditures)	\$6,156,450	\$649,742,549	105.5 times greater
Total Multiplier Effect (output, or ripple effect)	\$24,242,457	\$1,158,014,659	47.8 times greater
Jobs	524	10,986	21.0 times greater
<b><u>Per Pound:</u></b>			
Retail Sales (angler expenditures; seafood retail and restaurants)	\$5.83	\$132.90	22.8 times greater
Total Multiplier Effect (output, or ripple effect)	\$22.97	\$236.86	10.3 times greater
Jobs	.00050	.00225	4.5 times greater

The state economy will benefit by maximizing the percentage of fish caught by the recreational sector (harvested fish plus catch-and-release fishing). This is demonstrated in Table E-2, which presents the actual economic impacts from all striped bass activity in 2003, plus a hypothetical scenario based on all harvests occurring in the recreational sector.

**Table E-2: Actual and Hypothetical Economic Impacts of Massachusetts Striped Bass Harvests**

<b><u>Current 2003 Scenario:</u></b>	Commercial	Recreational	Total
Pounds Harvested	1,055,496	4,889,036	5,944,532
Retail Sales	\$6,156,450	\$649,742,549	\$655,898,999
Total Multiplier Effect	\$24,242,457	\$1,158,014,659	\$1,182,257,116
Jobs	524	10,986	11,510
<b><u>If Stripers Fully Allocated to Recreation:</u></b>			
Pounds Harvested	0	5,944,532	5,944,532
Retail Sales	\$0	\$850,512,997	\$850,512,997
Total Multiplier Effect	\$0	\$1,515,841,189	\$1,515,841,189
Jobs	0	14,381	14,381
<b><u>Net Increase in Impacts:</u></b>			
Pounds Harvested	-1,055,496	1,055,496	0
Retail Sales	-\$6,156,450	\$200,770,448	\$194,613,998
Total Multiplier Effect	-\$24,242,457	\$357,826,530	\$333,584,073
Jobs	-524	3,395	2,871

### **Economic Values:**

A full economic examination of a fishery should include economic values, when possible. Economic values examine economic efficiency, and look at changes in consumer surplus and producer surplus. Consumer surplus is the value of a good or service beyond what the customer

**Table 5: Recreational Multipliers Used in This Analysis (Impacts Per Dollar Spent)**

	Retail Sales	Total Multiplier Effect (output)	Salaries and Wages	Jobs	Sales and Motor Fuel Taxes	State Income Taxes	Federal Income Taxes
<b>Massachusetts</b>	1	1.782266933	0.453533969	0.000016908	0.060186976	0.021231887	0.076958074
<b>United States</b>	1	2.746529311	0.71905113	0.000026232	0.043581188	0.007550318	0.119978368

Source: Sport Fishing in America, Values of Our Traditional Pastime, American Sportfishing Association, 2003.

The multiplier data were for 2001, not 2003, which is the time frame of this report. However, without updated models showing any increases or decreases in the impact effects between 2001 and 2003, adjustments were not possible. Given the nature of the general economy to evolve slowly over time, economic multipliers would generally experience small changes from year to year. The U.S. Department of Commerce, reflecting the slowly evolving nature of the economy, only updates the data used to produce its RIMS-II economic multipliers every five years. Regardless, the economy does change gradually. Therefore, the multipliers used in this report are considered closely, but not perfectly, representative to 2003. The estimated economic effects of striped bass angler expenditures on travel-related expenses and equipment sales is presented in Table 6. The effects from only travel-related expenses are presented in Table 7 and explain the importance of striped bass angling to coastal-related tourism. Appendix I presents rough estimates of the number of striped bass anglers per state.

**Table 6: Estimated Economic Impacts, All Recreational Travel and Equipment Expenditures Combined**

	Retail Sales	Total Multiplier Effect (output)	Salaries and Wages	Jobs	Sales and Motor Fuel Taxes	State Income Taxes	Federal Income Taxes
Massachusetts	\$649,742,549	\$1,158,014,659	\$294,680,317	10,986	\$39,106,039	\$13,795,261	\$50,002,935
Atlantic Coast, Maine to North Carolina (including Massachusetts)	\$2,412,284,999	\$6,625,411,457	\$1,734,556,255	63,278	\$105,130,245	\$18,213,520	\$289,422,017
Per lb harvested in Massachusetts:	\$132.90	\$236.86	\$60.27	0.00225	\$8.00	\$2.82	\$10.23
Per fish caught and kept in Massachusetts:	\$1,596.03	\$2,844.55	\$723.85	0.02698	\$96.06	\$33.89	\$122.83
Per trip in Massachusetts:	\$246.87	\$439.99	\$111.96	0.00417	\$14.86	\$5.24	\$19.00

## 4.0 Economic Impacts from Reallocating Striped Bass

**NOTE: The mission of Stripers Forever is as follows: "Stripers Forever advocates eliminating all commercial fishing for wild striped bass, setting aside as much of the commercial quota as necessary to create and maintain healthier fish stocks, and allocating the rest to improve personal-use fishing for recreational anglers." The information presented in this section is *only* intended to demonstrate the greater economic returns produced by recreational fishing, even when fish are released, compared to commercial landings.**

This section looks at the differences in retail sales, jobs and overall economic activity stimulated by recreational and commercial harvests. Recognizing that boat, tackle and other equipment dealers have been vocal about the importance of striped bass management to their livelihoods, the recreational dollars analyzed here are based on Table 4, which includes travel and equipment expenditures.

Based on NOAA landings data, and matched with the economic impact information presented on the preceding pages, the respective impacts per pound of fish *landed* (versus caught and released) are presented in Table 9. Please note that these numbers do not reflect the fish allocated by government to the commercial and recreational sectors. Instead, they reflect actual fish caught as reported by NOAA Fisheries. Overall, on a per-pound basis, the recreational sector in Massachusetts generates greater impacts for the coastal economy, with over 22 times more in retail sales value per pound landed, over 10 times more economic activity across the state economy, and 4.5 times as many jobs.

**Table 9. Recreational Landings Compared to Commercial Harvests, 2003:**

	Commercial	Recreational	Recreational Impacts Are:
<b>Total:</b>			
Pounds Harvested	1,055,496	4,889,036	4.6 times greater
Retail Sales (angler expenditures; seafood retail and restaurants)	\$6,156,450	\$649,742,549	105.5 times greater
Total Multiplier Effect (or new economic activity)	\$24,242,457	\$1,158,014,659	47.8 times greater
Jobs	524	10,986	21.0 times greater
<b>Per Pound:</b>			
Retail Sales (angler expenditures; seafood retail and restaurants)	\$5.83	\$132.90	22.8 times greater
Total Multiplier Effect (or new economic activity)	\$22.97	\$236.86	10.3 times greater
Jobs	.00050	.00225	4.5 times greater

One goal of this study is to demonstrate the greater returns to coastal economies from recreational fishing for striped bass compared to commercial harvests. The greater returns from recreational activities are demonstrated next by comparing current economic impacts of striped bass harvests to a hypothetical scenario where fishing is limited to recreational anglers only.

**Table 17. Potential Recreational Impacts in Massachusetts if Stripers Were Fully Allocated to the Recreational Sector**

<u>Current 2003 Scenario:</u>	Commercial	Recreational	Total
Pounds Harvested	1,055,496	4,889,036	5,944,532
Retail Sales	\$6,156,450	649,742,549	655,898,999
Total Multiplier Effect	\$24,242,457	1,158,014,659	1,182,257,116
Jobs	524	10,986	11,510
<u>If Stripers Fully Allocated to Recreation:</u>			
Pounds Harvested	0	5,944,532	5,944,532
Retail Sales	\$0	\$850,512,997	\$850,512,997
Total Multiplier Effect	\$0	\$1,515,841,189	\$1,515,841,189
Jobs	0	14,381	14,381
<u>Net Increase in Impacts:</u>			
Pounds Harvested	-1,055,496	1,055,496	0
Retail Sales	-\$6,156,450	\$200,770,448	<b>\$194,613,998</b>
Total Multiplier Effect	-\$24,242,457	\$357,826,530	<b>\$333,584,073</b>
Jobs	-524	3,395	<b>2,871</b>

The two approaches, differing slightly, produce the same basic result: if all striped bass harvests had been made by recreational anglers only, the Massachusetts economy would have been increased by approximately \$334 million and have supported nearly 2,900 additional jobs. The goal of Stripers Forever is to eliminate all commercial fishing for wild striped bass and to set aside as much of the commercial quota as necessary to reduce overall mortality, increase the health of striped bass stocks, and improve recreational fishing. The arguments presented here state that the economic returns from striped bass stocks can be maximized through recreational angling, even when overall mortality is reduced.

*Potential Striper Management Revenue:*

To help offset the revenues lost from lower sales of commercial licenses, and to boost striped bass management activities, a stamp could be required for recreational anglers who wish to keep any stripers to eat. Considering the estimated number of striped bass anglers in Massachusetts, and three proposed price points for a striped bass stamp, the potential revenues that could be earned for striper management are presented below. (Please note that this table assumes all striped bass anglers would purchase a stamp, and does not exclude seniors or youth who might be exempted from purchasing a striped bass stamp).

Massachusetts Striped Bass Anglers:	548,691
Potential Revenues from a Massachusetts Striper Stamp:	
	\$2,743,45
@ \$5 annually:	5
	\$5,486,91
@ \$10 annually:	0
	\$8,230,36
@ \$15 annually:	5