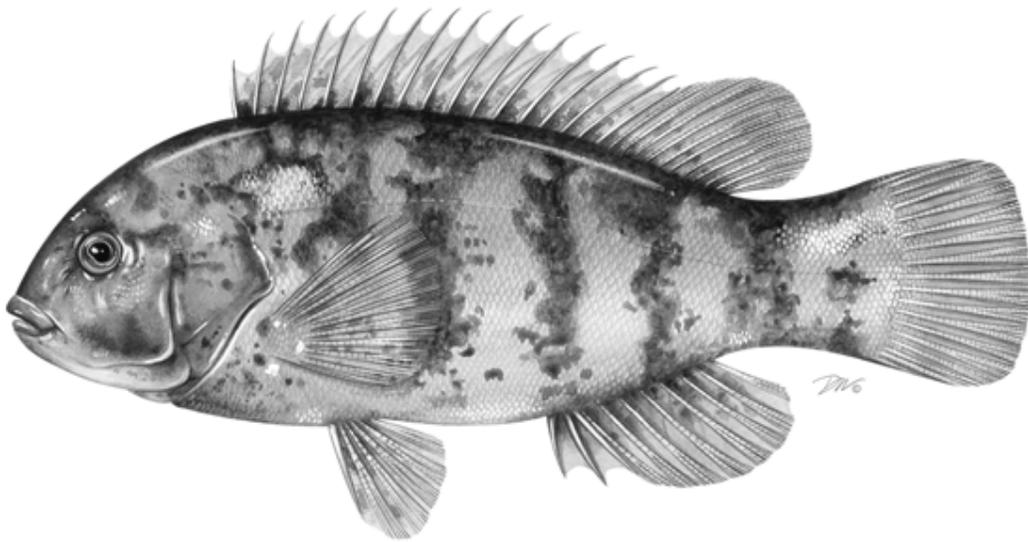


2008 REVIEW OF THE  
ATLANTIC STATES MARINE FISHERIES COMMISSION  
FISHERY MANAGEMENT PLAN FOR  
**TAUTOG**  
*(Tautoga onitis)*



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Board Approved: August 2010

**2008 REVIEW OF THE  
ASMFC FISHERY MANAGEMENT PLAN FOR  
TAUTOG (*Tautoga onitis*)**

**I. Status of Fishery Management Plan**

<u>Date of FMP Approval:</u>	March 1996
<u>Amendments:</u>	None
<u>Addenda:</u>	Addendum I (May 1997) Addendum II (November 1999) Addendum III (February 2002) Addendum IV (January 2007) Addendum V (August 2007)
<u>Management Unit:</u>	US waters of the northwest Atlantic Ocean from the shoreline to the seaward boundary of the EEZ, and from US/Canadian border to the southern end of the species range.
<u>States With Declared Interest:</u>	Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina.
<u>Active Boards/Committees:</u>	Tautog Management Board, Tautog Plan Development/Plan Review Team, Tautog Technical Committee, Tautog Stock Assessment Subcommittee, and Tautog Advisory Panel.

**a) Goals and Objectives**

The FMP established the following goals and objectives:

*Goals*

To perpetuate and enhance stocks of tautog through interstate fishery management so as to allow a recreational and commercial harvest consistent with the long term maintenance of self-sustaining spawning stocks.

To maintain recent (i.e. 1982 – 1991) utilization patterns and proportions of catch taken by commercial and recreational harvesters.

To provide for the conservation, restoration and enhancement of tautog critical habitat for all life history stages.

To maintain a healthy age structure.

To conserve the tautog resource along the Atlantic coast to preserve ecological benefits such as biodiversity and reef community stability, while maintaining the social and economic benefits of commercial and recreational utilization.

*Objectives*

To establish criteria, standards, and procedures for plan implementation as well as determination of states' compliance with management plan provisions.

To allow harvest that maintains spawning stock biomass in a condition that provides for perpetuation of self-sustaining spawning stocks in each spawning area, based on maintaining young-of-the-year indices, SSB, size and age structure, or other measures of spawning success at or above historical levels as established in the plan.

To achieve compatible equitable management measures among jurisdictions throughout the fishery management unit.

To enact management recommendations which apply to fish landed in each state, so that regulations apply to fish caught both inside and outside of state waters.

To promote cooperative interstate biological, social, and economic research, monitoring and law enforcement.

To encourage sufficient monitoring of the resource and collection of additional data, particularly in the southern portion of the species range, that are necessary for development of effective long-term management strategies and evaluation of the management program. Effective stock assessment and population dynamics modeling require more information on the status of the resource and the biology/community ecology of tautog than is currently available, in particular to facilitate calculation of F and stock trends.

To identify critical habitats and environmental factors that support or limit long term maintenance and productivity of sustainable tautog populations.

To adopt and promote standards of environmental quality necessary to the long term maintenance and productivity of tautog throughout their range.

To develop strategies that reduce fishing mortality, restore size competition and the historical recreational/commercial split, consider ecological and socio-economic impacts and identify problems associated with the offshore fishery. Compatible regulations between the states and the EEZ are essential.

## b) Fisheries Management Plan Summary

The Atlantic States Marine Fisheries Commission (Commission) adopted the Fishery Management Plan for Tautog in March 1996. The FMP requires a minimum possession size to increase the spawning stock biomass and yield to the fishery. It also includes fishing mortality targets intended to rebuild the stocks and to prevent overfishing.

Addendum I to the FMP was approved by the Tautog Management Board on May 19, 1997. This Addendum was in response to the Board's concern about difficulties to states in meeting the FMP's compliance schedule because of continuing problems with data deficiencies. Specifically, several states expressed concerns that the plan did not allow adequate time to determine state-specific fishing mortality rates. Further, the original FMP contained a compliance schedule that required states in the northern range of the species to implement management measures prior to states at the southern extent of the species range. Some of the members of the Management Board were concerned that the compliance dates should be consistent for states throughout the range of the species.

Addendum I required all states to implement management measures to reach the interim fishing mortality target ( $F=0.24$ ) and a 14" size limit by April 1, 1998. Additionally it included the requirement that all states implement management measures to achieve the fishing mortality target of 0.15 by April 1, 2000. Also, the Addendum included *de minimis* requirements and corrected several typographical errors in the original FMP.

In the fall of 1999, the Tautog Management Board requested that Addendum II be developed to address: (1) adjusting the compliance schedule and (2) developing a list of issues to be considered in a subsequent addendum or amendment. Addendum II extended the compliance schedule out to April 2, 2002 instead of the earlier requirement, which mandated states to meet the target overfishing definition by April 1, 2000. Addendum II also listed a variety of issues, including (1) the chosen plan target of  $F=M$  (2) clarification of the fishing mortality targets in the FMP with respect to individual state management program flexibility, (3) monitoring requirements in the FMP, (4) and data requirements to analyze management options by fishing modes within commercial and recreational fisheries.

Addendum III revised the plan target and compliance requirement from  $F=M=0.15$  to  $F_{40\% SSB}$  and updated information pertaining to tautog habitat and the data collection compliance requirements under the Atlantic Coastal Cooperative Statistics and Tagging Programs. Technical Addendum #1 to Addendum III corrected a typographical error in Addendum III to the FMP.

Addendum IV, approved by the Board on January 29, 2007 established spawning stock biomass target and threshold reference points allowing the ASMFC to determine whether or not the stock is overfished.<sup>1</sup> This Addendum also established a new fishing mortality

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<sup>1</sup> The analysis supporting the selection of the biomass reference points and fishing mortality rate are fully described in a document by the ASMFC Tautog Technical Committee. The document is titled *Development*

rate of  $F = 0.20$  to initiate rebuilding to the spawning stock biomass threshold and target levels. The  $F = 0.20$  requires a coastwide reduction of 28.6 percent reduction in overall fishing mortality rate. States may only get credit for reductions made in the recreational fishery States and are required to implement management measures consistent with the measures contained in Addendum IV by January 1, 2008.

Addendum V, approved by the Board in August 2007, allows states to make reductions in their recreational *and/or* commercial fishery to reach the  $F = 0.20$  fishing mortality rate established in Addendum IV.

## II. Status of Stocks

Overfishing definition:  $F_{target} = 0.29$  in 2007. Addendum IV & V established new  $F_{rebuild} = 0.20$  effective January 1, 2008.

Overfished definition:  $SSB_{target} = 26,800$  mt (59.1 million pounds);  $SSB_{threshold} = 20,100$  mt (44.3 million pounds).

Tautog stock status was last reviewed by the Technical Committee through an updated coastwide VPA run performed in the summer of 2006. Results depicted terminal year (2004) fishing mortality rates at 0.28 (Figure 1), above the existing overfishing definition. Stock biomass is well below the target and threshold levels (Figure 1).

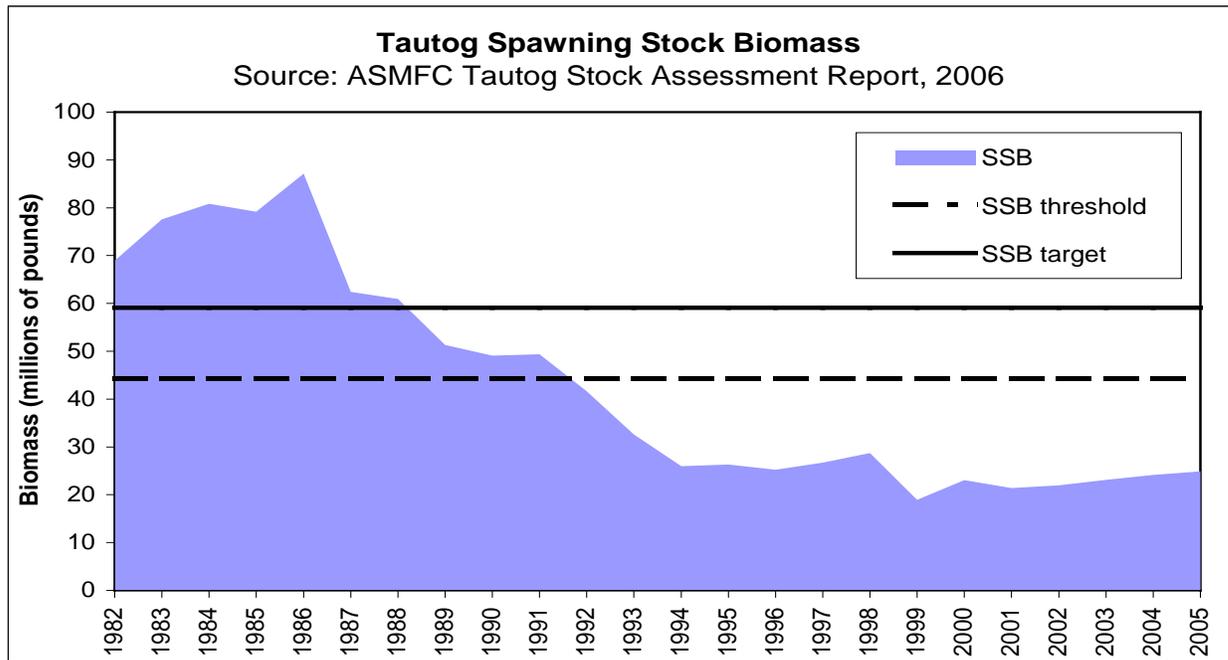


Figure 1. Tautog SSB 1982 – 2005. Source: 2006 ASMFC Tautog Stock Assessment Report.

### **III. Status of Assessment Advice**

Tautog is a long-lived species, with individuals over age 30 reported from Rhode Island and Connecticut. Most females mature (80%) at age 3. Natural mortality (M) has been estimated at  $M=0.15$  for males and  $M=0.2$  for females.

A benchmark stock assessment was most recently prepared in 2005, using data from 1981 through 2003. A coastwide estimate of fishing mortality rates was derived with a VPA using fisheries dependent and independent data (independent data from Massachusetts through New Jersey). Results indicated that fishing mortality rates have declined from a high of 0.71 in 1993 to 0.29 in 2003. The assessment was updated in 2006 to include 2004 harvest and discard information. Fishing mortality rates from that update depict the terminal year F (2004) at 0.28, below the 2007 overfishing definition  $F_{target} = 0.29$ . SSB stock size and total stock size remain well below the early time series averages.

For states south of NJ, a lack of fisheries independent data hampers efforts to estimate current fishing mortality rates and tautog abundance at the regional level. All states are collecting age and growth data to contribute to future stock assessments.

### **IV. Status of the Fishery**

The tautog fishing year runs from January 1 – December 31 annually. Historically, the fishery is 90% recreational but some states commercial landings have comprised almost 40% of total landings in 2008. Most landings occur in state waters between Cape Cod and the Chesapeake Bay in the spring and fall months. Some Mid-Atlantic Region fishermen pursue tautog year-round and there is an active fishery off the Virginia Coast in winter.

Peak total harvest (commercial landings + recreational harvest) since 2000 were 5.7 million pounds in 2002 with lows around 2.3 million pounds in 2003 & 2005 (Table 1, Figure 2). Commercial and recreational fishermen harvested 5.2 million pounds in 2007, the second highest amount since 2002. Total harvest dropped by roughly 1.5 million pounds from 2007 to 2008. Rhode Island, Connecticut, New York, New Jersey, and Delaware had the most significant recreational harvest (A + B1) in 2008 (Table 2).

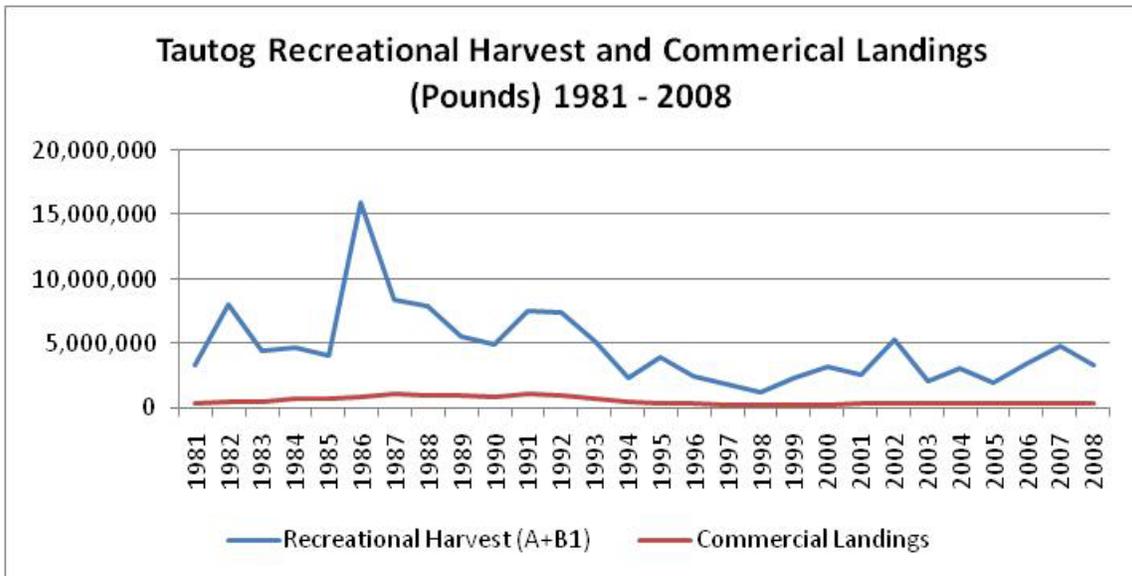


Figure 2: Tautog Recreational and Commercial Landings from 1981 – 2008. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

Table 1. Tautog recreational harvest, commercial landings, combined recreational harvest and commercial landings, and % recreational harvest. Source: personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

	<b>Recreational Harvest A + B1 (Pounds)</b>	<b>Commercial Landings (Pounds)</b>	<b>Total Harvest</b>	<b>% Recreational</b>
<b>1981</b>	3,372,393	331,200	3,703,593	91.1%
<b>1982</b>	8,066,041	416,956	8,482,997	95.1%
<b>1983</b>	4,482,370	423,819	4,906,189	91.4%
<b>1984</b>	4,711,323	676,415	5,387,738	87.4%
<b>1985</b>	4,006,290	732,731	4,739,021	84.5%
<b>1986</b>	15,988,257	939,006	16,927,263	94.5%
<b>1987</b>	8,446,030	1,154,400	9,600,430	88.0%
<b>1988</b>	7,891,697	1,068,014	8,959,711	88.1%
<b>1989</b>	5,571,414	1,008,931	6,580,345	84.7%
<b>1990</b>	4,926,731	868,354	5,795,085	85.0%
<b>1991</b>	7,482,225	1,105,053	8,587,278	87.1%
<b>1992</b>	7,415,232	1,007,783	8,423,015	88.0%
<b>1993</b>	5,168,613	693,017	5,861,630	88.2%
<b>1994</b>	2,366,982	448,050	2,815,032	84.1%
<b>1995</b>	3,954,030	345,547	4,299,577	92.0%
<b>1996</b>	2,406,585	329,698	2,736,283	88.0%
<b>1997</b>	1,812,781	255,441	2,068,222	87.6%
<b>1998</b>	1,206,243	239,416	1,445,659	83.4%
<b>1999</b>	2,329,441	187,924	2,517,365	92.5%
<b>2000</b>	3,210,159	232,655	3,442,814	93.2%
<b>2001</b>	2,622,146	290,893	2,913,039	90.0%
<b>2002</b>	5,314,349	328,615	5,642,964	94.2%
<b>2003</b>	2,049,100	329,216	2,378,316	86.2%
<b>2004</b>	3,112,156	281,568	3,393,724	91.7%
<b>2005</b>	1,955,327	260,282	2,215,609	88.3%
<b>2006</b>	3,486,444	340,628	3,827,072	91.1%
<b>2007</b>	4,780,763	365,948	5,146,711	92.9%
<b>2008</b>	3,365,966	299,986	3,665,952	91.8%

Table 2. Tautog recreational harvest (A + B1) in pounds by state, 1981-2008. Source: personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	790,611	664,568	242,336	1,496,039	161,423	6,585	10,295	742,653	536
1982	3,226,869	777,931	610,608	1,674,949	1,241,155	428,036	90,644	271,920	15,849
1983	1,837,263	615,595	458,581	1,124,844	414,956	4,438	6,550	1,267,164	20,143
1984	733,876	1,809,822	733,711	541,805	717,260	95,739	79,110	669,870	
1985	328,042	277,385	471,185	2,034,903	741,656	144,858	1,107	298,796	7,154
1986	7,862,585	2,042,584	838,345	2,833,206	2,132,571	264,744	10,049	918,139	4,173
1987	1,751,372	507,424	1,106,606	2,288,075	2,130,955	387,075	266,093	442,750	8,430
1988	2,255,930	612,123	610,172	2,380,285	1,331,832	249,803	446,947	1,410,003	4,605
1989	1,076,365	296,889	1,038,217	1,018,016	1,289,186	743,338	78,391	806,337	31,012
1990	895,326	389,579	199,999	1,980,289	1,256,488	142,627	59,720	229,442	2,703
1991	798,890	1,007,548	648,633	2,352,646	2,189,144	354,497	106,222	619,215	24,645
1992	1,668,485	656,713	1,048,638	1,199,558	2,485,693	183,855	159,730	255,996	12,560
1993	752,598	389,734	531,024	1,800,794	1,361,612	217,881	105,232	758,409	9,738
1994	373,188	328,668	417,439	585,037	330,551	152,034	177,358	1,101,129	2,707
1995	309,224	237,094	402,617	369,643	1,722,714	793,339	115,993	613,348	3,406
1996	397,284	248,840	245,817	193,046	1,123,173	158,751	26,484	778,314	13,190
1997	166,042	301,109	84,297	331,530	483,639	204,419	182,995	391,257	58,750
1998	96,694	316,338	231,622	208,743	41,431	257,347	27,648	273,516	26,420
1999	363,472	223,762	61,142	761,447	511,672	358,329	37,677	203,249	11,940
2000	442,816	203,601	58,475	258,099	1,812,959	373,580	56,127	188,187	4,502
2001	502,248	165,380	63,157	171,928	1,482,613	159,961	72,357	127,556	4,502
2002	521,611	265,116	447,139	2,135,221	1,184,560	652,008	104,247	116,798	4,447
2003	221,842	479,344	603,862	315,383	164,326	200,619	43,212	308,838	20,512
2004	123,394	546,289	449,293	1,235,936	215,039	459,403	39,592	631,680	43,210
2005	249,146	494,811	306,536	390,516	122,593	243,928	125,184	416,663	22,613
2006	251,975	402,234	702,189	945,348	699,378	434,339	44,343	535,700	6,638
2007	337,974	951,287	960,086	776,008	1,151,046	277,941	273,586	211,860	52,835
2008	96,584	458,127	784,443	961,102	557,788	423,929	82,194	189,232	1,799

Commercial landings were 299,986 pounds in 2008, averaging 8% of total harvest in 2008 (Table 1). Commercial interest in tautog has increased in response to higher market prices, exceeding \$1.00/lb at times. Most commercial landings are taken by otter trawls, with gillnets, handlines, fish pots, and lobster traps all accounting for a share. Massachusetts, Rhode Island, New York, and New Jersey had the most significant commercial landings in 2008. Massachusetts had the greatest percent commercial landings at 43% (Table 4).

Table 3. Tautog commercial landings in pounds by state, 1981-2008. Source: personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	102,900	69,800	20,500	81,400	54,400	1,000	1,200	700	
1982	69,300	86,300	21,200	90,400	148,200	800	100	2,600	656
1983	57,600	142,600	33,500	88,400	100,600	800		1,700	319
1984	68,100	334,700	32,700	102,500	129,700	1,400	2,600	1,200	4,715
1985	63,300	403,200	50,100	84,500	125,500	3,200	2,400	1,639	531
1986	165,800	363,100	104,200	201,300	100,700	300	2,600	1,800	1,006
1987	250,000	420,500	159,200	225,200	95,200	500	3,800	2,700	
1988	277,100	328,900	112,100	255,000	88,000	600	6,100	2,800	214
1989	352,100	214,800	99,700	285,400	51,900	500	4,000	7,500	531
1990	289,074	211,084	82,008	181,543	99,112	500	3,954	5,151	1,079
1991	354,346	371,597	54,000	226,413	93,022	1,300	3,164	5,058	1,211
1992	292,291	359,767	65,700	169,011	116,332	200	4,058	4,389	424
1993	160,336	201,593	86,064	89,467	153,474	300	1,432	5,423	351
1994	37,062	130,719	43,000	71,375	162,641	400	1,718	11,441	1,135
1995	35,298	94,989	20,466	72,879	115,970	600	4,416	30,020	929
1996	32,579	64,817	33,327	105,466	89,435		3,622	26,137	452
1997	64,240	39,601	14,519	78,228	49,726	841	7,663	25,471	623
1998	91,319	20,304	6,905	68,892	42,426	1,715	5,682	14,770	2,173
1999	75,619	26,090	12,961	37,886	27,307	844	6,489	20,901	728
2000	96,001	43,719	8,504	39,953	39,636	272	3,896	14,794	674
2001	84,330	56,065	22,259	62,795	60,152	287	4,591	14,587	414
2002	148,073	50,007	26,781	60,805	36,605	629	5,010	22,834	705
2003	86,205	54,650	40,784	72,264	66,186	3,816	5,213	10,705	98
2004	88,176	36,581	26,037	76,606	51,020	3,064		13,035	84
2005	99,344	42,842		52,525	61,128		4,387	5,667	56
2006	147,603	46,449	16,841	68,312	55,532	433	5,411	8,533	47
2007	95,820	101,159	30,053	73,735	62,980	2,013		9,808	188
2008	73,867	48,029	20,160	88,430	63,958	1,255	4,093	11,386	194

Table 4. 2008 percent recreational harvest (A + B1) and commercial landings.

2008	% Recreational	% Commercial
MA	56.66%	43.34%
RI	90.51%	9.49%
CT	97.49%	2.51%
NY	91.57%	8.43%
NJ	89.71%	10.29%
DE	99.70%	0.30%
MD	95.26%	4.74%
VA	94.32%	5.68%
NC	90.27%	9.73%

## V. Status of Research and Monitoring

Addendum III requires all states to collect data to continue support of a coast-wide stock assessment until such time that there are sufficient data and analyses to allow for regional or redefined regional assessment approaches. As such, states are required to collect and report commercial and recreational catch estimates, a suitable time series of fisheries independent indices of abundance as determined by the Tautog Technical committee, and 200 age and length samples per state, within the range of lengths commonly caught by the fisheries.

In Massachusetts, the 2008 fisheries independent monitoring program for tautog consisted of sampling for age and growth parameters through the purchase of specimens from local commercial fishermen and some limited directed sampling using pots and rod and reel, for a total age sample of 305 fish. Summary age and growth data are presented as Attachment A of Massachusetts compliance report. For a more detailed report of their current age and growth sampling see the DMF 2008 Federal Aid Progress Report Job 11. The Division also obtains some limited age and maturity samples and biomass data (stratified mean number and mean weight per tow) from our synoptic spring and fall otter trawl surveys. This coast-wide state waters survey of approximately 100 - twenty minute tows, has a random stratified design. The index for tautog includes data from all strata south of Cape Cod. While the index of abundance obtained from the survey can be quite variable from year to year the spring index series appears to track long term trends for adult tautog, and was used for tuning of the recent Coast-wide VPA stock assessment update and for a regional VPA with Rhode Island. See Attachment B of Massachusetts compliance report for a plot of the index values over time. The 2008 index shows a slight increase in numbers and biomass from those observed in 2007 with a lag in weight indicative of an increase in smaller fish recruiting to the survey gear.

Rhode Island sampled 392 tautog from the fall recreational fishery for aging. Commercial landings were monitored by the Standard Atlantic Fisheries Information System (SAFIS).

The recreational fishery was monitored by the Marine Recreational Fisheries Statistics Survey (MRFSS).

For fisheries independent monitoring in Rhode Island during 2008, mean number per tow increased over that recorded during 2007 for the Narragansett Bay monthly trawl survey to 0.581 fish/tow. Mean weight per tow for the 2008 monthly trawl survey decreased to 0.927 kg/tow. Mean number per tow increased during the 2008 seasonal trawl survey in Narragansett Bay to 0.262 fish/tow. Mean weight per tow increased to 0.380 kg/tow (Olszewski, 2008).

In Connecticut, Tautog abundance has been monitored since 1984 via Connecticut's Long Island Sound Trawl Survey. Survey results are summarized in detail in annual reports to the US Fish and Wildlife Service and are available online at CT DEP's website: [http://www.ct.gov/dep/cwp/view.asp?a=2696&q=322718&depNav\\_GID=1630&depNav=3](http://www.ct.gov/dep/cwp/view.asp?a=2696&q=322718&depNav_GID=1630&depNav=3). The spring 2008 index of 0.50 fish per tow (geometric mean) is the sixth consecutive year the index has been below the time series mean of 0.77. Indices from 1993-1999 generally ranged from 0.40 to 0.49. Indices improved to 0.57 in 2000 and to 0.70 in 2001 before reaching 0.91 in 2002.

In New York in 2007, age samples were collected primarily from Eastern Long Island Sound (Port Jefferson to Orient) party and charter boats with a small number of samples collected from Long Island's south shore (Sheepshead Bay to Shinnecock). The size range of these samples was from 320 mm to 650 mm total length. The majority of fish were less than 480 mm. Fish greater than 500 mm were uncommon, either because they were not caught regularly or fishermen prefer to take that size fish home whole. An additional 37 length measurements were obtained. Age samples were not taken from these fish because adequate samples from that size range (342 mm-429 mm) had already been obtained. One hundred and seventy-one samples were obtained for age analysis and an age-length key. In 2008, New York made nine monitoring trips on party boats fishing for blackfish. Data and hard part samples were collected from primarily the for-hire sector. We collected 254 samples for age analysis and measured an additional 503 fish, which consisted of both fish that were landed and ones that were regulatory discards. The size range of all fish measured from the recreational fishery was 160 mm to 600 mm total length. Processing and analysis of the 2008 age samples is ongoing. In 2008, data and hard part samples were collected from fish markets, primarily on the east end of Long Island. Eighty one samples were collected from commercial markets for age analysis from May through November 2008. Processing and analysis of these samples is ongoing. The department went on one trip with a commercial fisherman on December 3, 2008. Fifteen undersized tautog were discarded and ranged from 270 mm to 352 mm. Twenty tautog were retained and ranged from 358 mm to 545 mm. In addition to tautog, 5 red hake were also caught and retained and 33 spiny dogfish were caught and discarded.

The New York State Department of Environmental Conservation (NYS DEC) has been conducting a small-mesh trawl survey targeting juvenile finfish since 1987. The survey runs from May through October. Using a small mesh sixteen-foot semi-balloon shrimp trawl, 60 to 80 randomly chosen stations are sampled each month. The arithmetic mean

catch per tow (CPUE) of tautog from 1987 - 2004 ranged from 0.21 to 1.37 fish/tow and averages 0.56 fish/tow. The CPUE reached a series high in 2002 and has been declining since then. For 2004, the catch per tow was 0.42 tautog per tow; no trawl survey data is available for 2005 and 2006. In 2007 the catch per tow was 0.57 tautog per tow. In 2008, repairs to the trawl vessel delayed the start of the survey until August. For the period of August through October 2008, the catch per tow was 1.5 fish per tow. Greater availability and vulnerability of YOY tautog to the trawl gear during those months may be the reason the CPUE is higher for that period compared to years where the survey was conducted from May through October.

In 2007, the NYS DEC initiated a fish-pot study in Long Island Sound. The first year was a pilot year to determine the feasibility of such a survey for long term monitoring. Thirty fish traps were deployed on June 8, and 11, 2007 in the vicinity of Mattituck and Horton Point, Southold Long Island. Efforts were made to deploy the traps near submerged rocks where blackfish would be expected to be found. The traps were checked weekly weather permitting and all fish were counted and measured. Six-hundred and fifteen tautog were captured in the traps. The mean size was 230 mm total length with a range of 62 to 476 mm (Figure 3). One hundred and ninety females and 146 males were identified. The remaining 239 were of unknown sex. The traps were left in the water until the CPUE of tautog began to drop. On, November 20, 2007 all of the traps were removed from the water, with the exception of 5 traps. These 5 traps were deployed around the Mattituck sea buoy to see if the tautog may have moved to deeper water and were left in until December 19, 2007. The weekly highest CPUE of tautog occurred during the first week of December when 72 tautog were captured in 5 traps (CPUE 14.4). The second highest CPUE occurred during the last week of July through August where CPUE ranged from 0.9 to 2.0 fish per trap. Tautog were the 3<sup>rd</sup> most numerous fish species after scup and black sea bass. Nine-spine spider crabs were the most abundant invertebrate species followed by flat clawed hermit crabs and rock crabs. In 2008, the study was expanded to 40 pots/stations and sampling locations were added further east to Rocky Point in East Marion. The pots were deployed on May 29 and June 10, 2008 and removed on October 27 to November 11, 2008. A total of 3,158 blackfish were captured in the pots and ranged in size from 77 mm to 484 mm total length (Figure 4). Three hundred and twenty nine males and five hundred and two females were identified. The sex of the remaining 2,314 fish was undetermined. Blackfish were the most numerous species caught followed by black sea bass (1,850) and scup (1,418). Hermit crabs were the most abundant invertebrate caught in the traps followed by six-spine spider crabs.

The New Jersey Bureau of Marine Fisheries personnel and staff from NJ ACCSP sampled the recreational and commercial fishery harvest during the spring and winter fisheries, obtaining 505 racks. Unlike previous years where all samples were collected from party/charter vessels, some of the 2008 samples were collected from commercial hook and line fishermen and otter trawl. The fish racks were taken to the Nacote Creek facility where measurements and opercular bones were taken and stored for future processing. The opercular bones are currently being processed, and when completed will be used to develop an age/length key for the 2008 New Jersey recreational fishery. Only permitted fishermen are allowed to take tautog for purposes of sale in New Jersey. There

are only forty-one (41) directed fishery and twenty-two (22) non-directed fishery permittees in the New Jersey commercial tautog fishery. All permittees are required to submit monthly reports identifying tautog landings by day, gear, and location, as well as any by-catch.

The New Jersey Bureau of Marine Fisheries conducts five (5) near shore (within 12 nautical miles) trawl surveys each year. These surveys occur in January/February, April, June, August, and October. All tautog taken during these surveys are weighed and measured (Figure 2). Catch per unit effort (CPUE) in number of fish per tow and biomass (kilograms) per tow is calculated each year. This New Jersey trawl survey is the only fishery independent survey in the Southern Region (NJ-VA).

In Maryland, 248 tautogs were captured in fish pots by commercial fishermen and purchased by MDNR for biological data collection in 2008. For sampling purposes, letters were provided to harvesters to allow for the possession of sub legal tautog, and to allow tautog in excess of commercial possession limits. All tautogs sampled were measured for total length (TL) in millimeters (mm) and weighed in grams (g). Means are reported  $\pm$  SE. Additional data collected included sample date, age, sex, and gear type. Sampled fish lengths ranged in size from 238mm to 555mm, with a mean of 337mm ( $\pm 3.6$ ) and median of 330mm for both females and males combined. Weights ranged from 295g to 3531g, with a mean of 821g ( $\pm 29.7$ ) and a median of 688g. Females comprised 71% (n=171) of the samples and averaged 328mm ( $\pm 3.8$  mm) with a median of 323mm (Figure 1). Mean female weight was 744g ( $\pm 27.3$ ) with a median of 652g (Figure 2). Males made up 29% of the sampled tautogs (n=71) and were longer (mean TL 362mm;  $\pm 8.1$ ) and weighed more (mean weight 1028g;  $\pm 74.9$ ) than females.

Juveniles were captured in the 2008 Maryland Department of Natural Resources (MDNR) annual trawl and beach seine survey, components of the Investigation of Maryland's Coastal Bays and Atlantic Ocean Finfish Stocks. However, it should be noted that this multi-species survey is not well suited for determining tautog abundance due to the limitations of gear types used to sample tautog habitat, thus both the trawl and seine gears suffer from low tautog catches. Tautogs were captured in 7 of 140 trawls (5.0%, 8 individuals), and in 2 of 38 beach seines (5.3%, 2 individuals; Bolinger et al. unpublished). The trawl and beach seine CPUEs were 0.06 fish/hectare and 0.3 fish/haul, respectively.

The Virginia Marine Resources Commission (VMRC) introduced its Marine Sportfish Collection Project in June 2007. The program sets up freezers through portions of the Chesapeake Bay where recreational anglers can donate their whole fish or carcasses on a voluntary basis. The donated fish are processed for sex, length, and age. In August 2007, tautog was added to the list of species collected by the program. There were 102 tautog donated to the project in 2008. All were donated by recreational hook and line fishermen (Table 1). The VMRC Biological Sampling Program sampled an additional 2 tautog harvested by recreational spears. The lengths of tautog sampled from the recreational fishery ranged from 14.0 in TL (35.6 cm TL) to 23.3 in TL (59.3 cm TL; Table 2). The average length of the tautog samples was 16.3 in TL (41.4 cm TL). Otoliths were

collected from all tautog sampled from the recreational fishery and will be processed for ageing.

The MRFSS program routinely samples recreational harvest (Type A+B1) encountered in its intercept survey to collect biological data. The final estimates for 2008 were available through the MRFSS online query, though the raw intercept data are not yet available (NMFS, Fisheries Statistics and Economics Division, Silver Spring, MD, pers. comm.). The tautog sampled by MRFSS ranged in length from 13 in fork length (FL; 33 cm FL) to 30 in FL (76 cm FL). The average length of the MRFSS samples was 17.1 in FL (43.6 cm FL). The average weight was 4.2 lb (1.9 kg).

The Virginia Game Fish Tagging Program (VGFTP)—a cooperative project of the VMRC Saltwater Fishing Tournament Program and the Virginia Marine Resources Commission's (VIMS) Sea Grant Marine Advisory Program—was initiated in 1995 to enhance data collection of selected species, including tautog, using recreational anglers and to educate anglers. The program's primary funding source is revenues from Virginia's saltwater recreational fishing license. In 2008, there were 454 tautog tagged and 86 recaptured (from multiple years). Since 1995 there have been a total of 13,343 tautog tagged and 2,141 recaptured, with an overall recapture rate of 16.0%. The tag-recapture data for tautog have provided evidence of strong fidelity to initial tagging sites (J. Lucy, Virginia Sea Grant Program, pers. comm.). The tagging results have also shown that there is little seasonal movement between inshore and offshore; such seasonal movements have been observed for tautog occurring in waters from New York north. The recapture data have consistently demonstrated that tautog tagged in Virginia waters or waters offshore of the state do not migrate in significant numbers to waters north of Delaware.

In the summer of 2007, the VMRC introduced the Virginia Saltwater Fisherman's Journal, a voluntary online reporting system for recreational anglers (available at <https://www.vasaltwaterjournal.com>). Anglers can keep a record of their fishing activities including trip dates, locations, weather conditions, species caught, quantities, lengths, weights, disposition (i.e., kept or released), gears, baits, and more. The anglers can choose to make their information publicly available to other participants in the program. The data provide the VMRC anecdotal information on the distribution and sizes of recreational species in the Chesapeake Bay, and they give information on the performance of Virginia's artificial reefs. In 2008, participating anglers provided information on twenty caught and kept tautog. These kept tautog ranged in length from 16 to 22 inches. There were no reports of released tautog in the shared public data for 2008.

## **VI. Status of Management Measures and Issues**

Addendum III to the Interstate Fishery Management Plan for Tautog specifies a 14" minimum size limit for the recreational and commercial fishery. Addendum IV & V specified a rebuilding fishing mortality rate = 0.20 which required a 25.6% reduction in exploitation from the coastwide average based on the 2006 Assessment update. Addendum IV & V allows states to reduce less "if a state can provide evidence, at the

same level of precision as most recent assessment, of fishing mortality rates below those indicated in the assessment, then that state is only required to implement restrictions that will be sufficient to reach the target fishing mortality level.”

## VII. Implementation of FMP Compliance Requirements

States were required to implement regulations to meet  $F = 0.20$  by January 1, 2008. Massachusetts and Rhode Island submitted a regional VPA analysis and proposal to reduce harvest by only 12% based on a regional  $F = 0.22$  in 2004 and  $F = 0.11$  in 2005. The technical committee (TC) reviewed the proposal and recommended the Board approve the MA/RI proposal. Upon review the Board approved a 12% harvest reduction for Massachusetts and Rhode Island. All other states were required to implement the full  $F$  reduction required by Addendum IV & V.

States submitted proposed regulations to the PRT in the summer of 2007. The TC reviewed each proposal and submitted a report to the Board who approved the proposals. All states implemented approved regulations around the beginning of 2008 and ***the Plan Review Team finds that all states meet or exceed the requirements of the FMP.*** Table 5 & 6 show new 2008 regulations and Table 7 & 8 show the 2007 regulations.

According to Addendum I, a state must prove that its commercial landings in the most recent year for which data is available did not exceed the greater of 10,000 pounds or 1% of the coastwide commercial landings to qualify for *de minimis* status. States must request *de minimis* status each year and requests for *de minimis* status will be reviewed by the Tautog Plan Review Team as part of the annual FMP review process. A state that is granted *de minimis* status is required to implement the 14” minimum size limit for the commercial fishery, the pot and trap degradable fastener provisions, and regulations in the commercial fishery that are consistent with those in the recreational fishery. ***The states of Delaware (2,253 lbs – 2008) and North Carolina (194 lbs – 2008) meet these criteria for calendar year 2008, and both states have formally requested de minimis status for the 2009 fishing year.***

## VIII. Prioritized Research Needs

1. Increased catch and discard length sampling from the commercial/recreational fishery for all states from Massachusetts through Virginia.
2. Increase MRFSS sampling levels to improve recreational catch estimates by state and mode. Current sampling levels are high during times of the year when more abundant and popular species are abundant in catches, but much lower than in early spring/late fall when tautog catches are more likely.
3. Establish standardized state-by-state long-term fisheries independent surveys to monitor tautog abundance and length-frequency distributions, and to develop young-of-the-year indices.

4. Continue and expand biological sampling of recreational and commercial catches, by mode and gears respectively (Including weights, lengths, sex, maturity, and especially age from hard parts) at minimum levels as established by the FMP.
5. Collect effort data for determining commercial and recreational CPUE.
6. Define the status (condition and extent) of optimum or suitable juvenile habitats and trends in specific areas important to the species.
7. Determine pot and trap escape vent dimensions needed to release tautog over a range of sizes.
8. Explore possible regional and local genetic differences (stock differentiation) and relate these to recruitment, growth, exploitation rates, and habitat differences. These differences can help support appropriate region-specific management strategies.
9. Define the specific spawning and pre-spawning aggregating areas and wintering areas of juveniles and adults used by all major local populations, as well as the migration routes used by tautog to get to and from spawning and wintering areas and the criteria or times of use.
10. Define local and regional movement patterns and site fidelity in the southern part of the species range. This information may provide insights into questions of aggregation vs. recruitment to artificial reef locations. (Note: This work is currently being conducted as a Masters Thesis at VIMS)
11. Collect basic sociocultural data on tautog user groups including demographics, location, and aspects of fishing practices such as seasonality.
12. Conduct studies in areas where the availability of primary prey, such as blue mussels or crabs, is dependent on annual recruitment, the effect of prey recruitment variability be investigated as a factor in tautog movements (to find better prey fields), mortality (greater predation exposure when leaving shelter to forage open bottom), and relationship between reef prey availability/quality on tautog condition/fecundity.
13. Define the susceptibility of juveniles to coastal and anthropogenic contamination and resulting effects. The synergistic effects of leaked fuel, bilge water, treated pilings, and antifouling paints on tautog health should also be studied.
14. Confirm that tautog, like cunner, hibernate in the winter, and in what areas and temperature thresholds, for how long, and are there special habitat requirements during these times that should be protected or conserved from damage or disturbance. This information will aid in understanding behavior variability and harvest availability.

15. Define larval diets and prey availability requirements. This information can be used as determinants of recruitment success and habitat function status. Information can also be used to support aquaculture ventures with this species.
16. Reexamine the source of offshore eggs and larvae (in situ spawning or washed out coastal spawning).



Table 5. 2008 Commercial Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS	QUOTA	GEAR RESTRICTIONS
Massachusetts	16"	40	April 16-May 15 September 1- November 30	64,753 lbs	Yes
Rhode Island	16"		April 15 - May 30 August 1 - September 15 October 15 - December 15	51,348 pounds divided equally among 3 open seasons.	Yes
Connecticut	14"	a	January 1-April 30 June 15 - August 31 October 15 - December 6		Yes
New York	14"	b	January 1 - February 28 April 8 - December 31		Yes
New Jersey	14"		January 1 - 15 June 5 - 30 November 1 - December 31	103,000lbs	Yes
Delaware	14"	10	January 1 - March 31		Yes
	15"	3	April 1 - May 11		
	14"	10	July 1 - August 31		
Maryland	14"	10	September 29 - December 31		Yes
		4	Jan 1- May 15		
		2	May 16 - October 30		
Virginia	14"	4	November 1 - 30		
			January 1 - April 15 October 3 - November 31 December 16 - 31		

a The trawl fishery has a possession limit of 50 fish, the commercial hook, fish pot, trap net, fyke net, and gill net fisheries the possession limit is 25 fish, and in the lobster pot fishery the possession limit is 10 fish. Holders of Connecticut Marine Pound Net Registration may possess up to twelve fish year round except that during the May 1 through June 14 closed season all female tautog must be released without avoidable injury. All possession limits are daily limits.

b New York has a 25 fish vessel trip limit for commercially caught tautog, except only 10 per vessel are allowed when lobster pot gear and more than six lobsters are in possession.

Table 6. 2008 Recreational Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS
Massachusetts	16"	3	-
Rhode Island	16"	3	April 15 - May 31
	16"	3	July 1 - October 16
		8	October 17- December 15
Connecticut	14"	4	January 1-April 30
	14"	2	July 1 - August 31
	14"	4	October 1 - December 6
New York	14"	4	January 17 - April 30
	14"	4	October 1 - December 20
New Jersey	14"	4	January 1 - April 30
	14"	1	July 16 - November 15
	14"	6	November 16 - December 31
Delaware	14"	10	January 1 - March 31
	15"	3	April 1 - May 11
	14"	10	July 1 - August 31
	14"	10	September 29 - December 31
Maryland	14"	4	Jan 1- May 15
		2	May 16 - October 30
		4	November 1 - 30
Virginia	14"	4	January 1 - April 30
		4	June 25 - December 31

Table 7. 2007 Commercial Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	SEASONS	QUOTA	GEAR RESTRICTIONS
Massachusetts	16"	40	April 16-May 15 September 1-November 30	96,000 lbs	Yes
Rhode Island	16" 16" 16"	10 10 10	April 15-May 30 August 1-September 15 October 15-December 31	15,440 lbs 15,440 lbs 15,440 lbs	Yes
Connecticut	14"	a	January 1-April 30 June 15-December 31		Yes
New York	14"	b	April 8 – Feb. 28		Yes
New Jersey	14"		April 15-June 30 November 1-January 15	103,000lbs	Yes
Delaware	14" 14" 15"	10 10 3	Jul 1 – July 31 Oct 1 - Mar 31 Apr 1 - Jun 30		
Maryland	14"	5	Open		Yes
Virginia	14"		Jan 1- April 30 Sept 1- Dec 31		Yes

a The trawl fishery has a possession limit of 75 fish, the commercial hook, fish pot, trap net, fyke net, and gill net fisheries the possession limit is 25 fish, and in the lobster pot fishery the possession limit is 10 fish. Holders of Connecticut Marine Pound Net Registration may possess up to twelve fish year round except that during the May 1 through June 14 closed season all female tautog must be released without avoidable injury. All possession limits are daily limits.

b New York has a 25 fish vessel trip limit for commercially caught tautog, except only 10 per vessel are allowed when lobster pot gear and more than six lobsters are in possession.

Table 8. 2007 Recreational Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	SEASONS
Massachusetts	16"	3	-
Rhode Island	16" 16"	3 3	May 1-May 31 July 1-October 22 October 23-December 15
Connecticut	14" 14" 14"	4 (daily) 4 (daily) 4 (daily)	January 1-April 30 June 15- September 7 September 22-December 13
New York	14"	10	October 1-May 31
New Jersey	14" 14" 14"	4 1 8	January 1-May 31 June 1-November 14 November 15-December 31
Delaware	14" 14" 15"	10 10 3	Jul 1 – July 31 Oct 1 - Mar 31 Apr 1 - Jun 30
Maryland	14"	5	Open
Virginia	14"	7	Open

a