

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR TAUTOG
(Tautoga onitis)

2010 FISHING YEAR



Prepared by the Plan Review Team

Approved by the Tautog Management
Board August 2011

**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 (Board), Tautog Plan Development Team (PDT), Tautog Plan Review Team (PRT), Tautog Technical Committee, Tautog Stock Assessment Subcommittee (SAS), and Tautog Advisory Panel (AP).

a) Goals and Objectives

The 1996 Fishery Management Plan for Tautog (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 14" minimum size limit to increase the spawning stock biomass and yield to the fishery. It also set the fishing mortality

target = 0.15 to rebuild the stocks and to prevent overfishing, but allowed states two years to achieve the target.

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. Finally, 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 to achieve $F_{target} = 0.15$ 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 (approved February 2002) 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.¹ This Addendum also established a new fishing mortality rate of $F = 0.20$ to initiate rebuilding to the spawning stock biomass threshold and target levels. The $F = 0.20$ required a coastwide reduction of 28.6 percent reduction in overall fishing mortality rate, which is equal or a 25.6% reduction in exploitation. States may only get credit for reductions made in

¹ 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 of Fishing Mortality and Spawning Stock Biomass Reference Points Option for Addendum IV to the Tautog Fishery Management Plan*.

their recreational fishery and must 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.

Addendum VI, approved in March 2011, further reduced the F_{target} to 0.15. States are required to implement reductions to achieve $F = 0.15$ by January 1, 2012. The reduced F_{target} was in response to the stock continuing to be overfished with overfishing occurring. According to the 2011 stock assessment update, spawning stock biomass (SSB) has remained at low levels for the last decade, with 2009 SSB estimated at 10,553 metric tons — 39% of the target SSB (26,800 metric tons). Addendum IV did not apply to the 2010 fishing season.

II. Status of Stocks²

Overfishing definition: $F_{\text{rebuild}} = 0.20$

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

Tautog stock status was last reviewed by the SAS 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 Addendum IV target $F = 0.20$. Stock biomass is significantly below the target and threshold levels (Figure 1).

² Does not include results of the 2011 Stock Assessment which was not available during the 2010 fishing season.

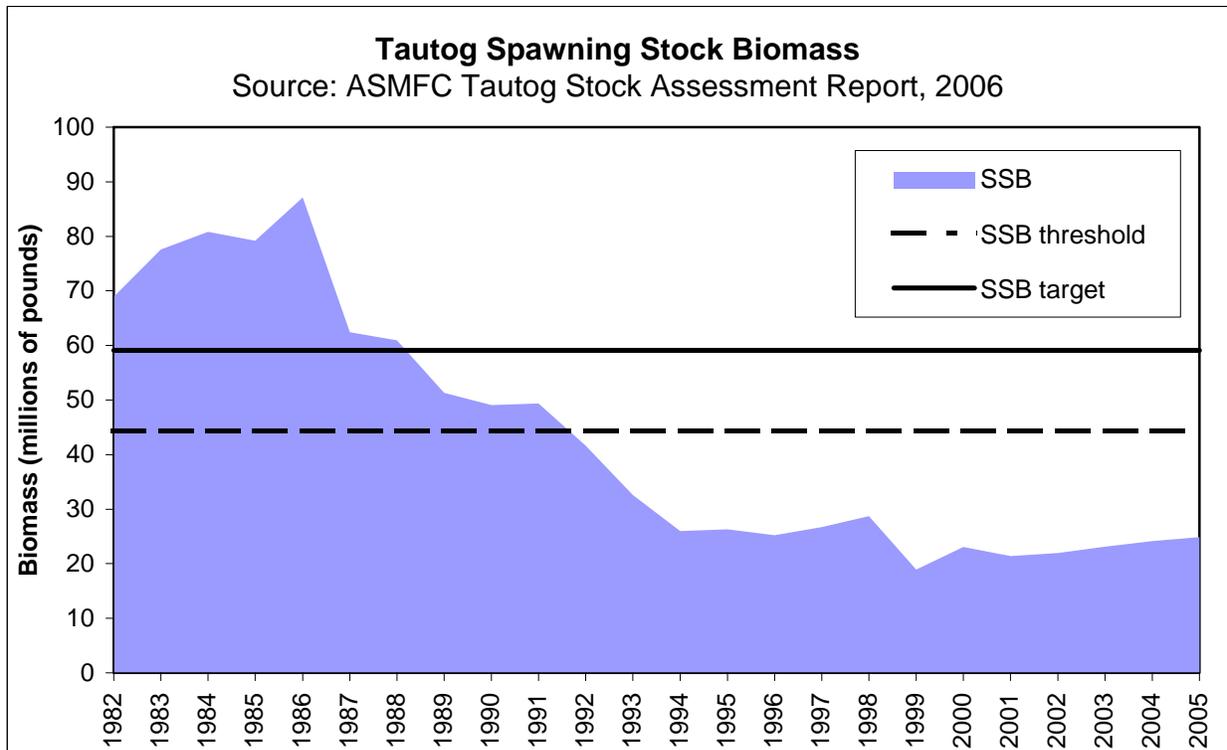


Figure 1. Tautog SSB 1982 – 2005. Source: 2006 ASMFC Tautog Stock Assessment Report.

III. Status of Assessment Advice³

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 overfishing definition. 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.

³ Does not include results of 2011 Assessment Update that was not available in 2010.

IV. Status of the Fishery

The tautog fishing year runs from January 1 – December 31 annually. Historically, the fishery is around 90% recreational but some states commercial landings have comprised up to 40% of their total landings in recent years (Table 4). 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 2.6 million pounds in 2003 & 2005 (Table 1, Figure 2). Commercial and recreational fishermen harvested a combined 3.7 million pounds in 2010, roughly 200,000 pounds more than in 2009. Commercial landings totaled 241,695 pounds in 2010 accounting for only 6.4% of total coastwide harvest.

New Jersey had the largest recreational harvest of any state (919,748 pounds) accounting for 26% of 2010 coastwide recreational harvest. Rhode Island (16%, 575,883 pounds), New York (16%, 564,904), and Virginia (14%, 505,014) also had significant recreational harvest (Table 5).

In 2010, New York (38%, 92,407 pounds) and Massachusetts (31%, 75,317 pounds) had the most significant commercial harvest of any state. Rhode Island also had significant commercial harvest (18%, 44,104 pounds) in 2010 (Table 5).

New Jersey (25%), New York (18%), Rhode Island (17%) and Virginia (13%) had the most significant total harvest (commercial landings and recreational A + B1) in 2010 (Table 5).

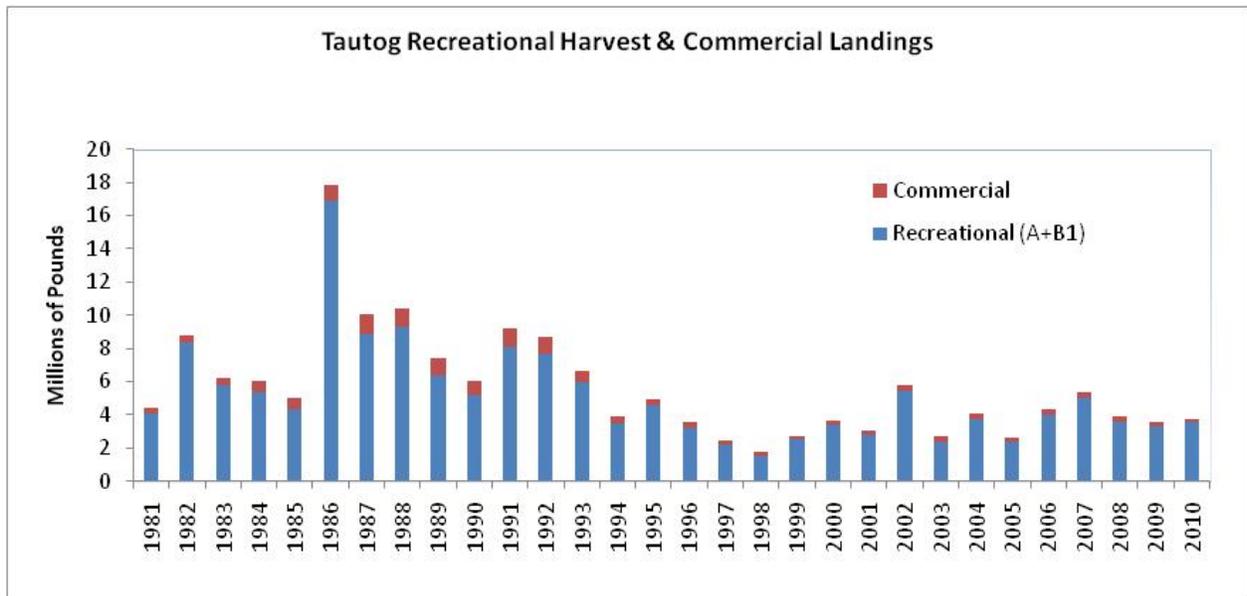


Figure 2: Tautog Recreational and Commercial Landings from 1981 – 2010. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD (recreational 1981 – 2010 and commercial 1981 - 2009) and ACCSP Data Warehouse (commercial 2010).

Table 1. Tautog Recreational and Commercial Landings from 1981 – 2010. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD (recreational 1981 – 2010 and commercial 1981 - 2009) and ACCSP Data Warehouse (commercial 2010).

	Commercial Landings (Pounds)	Recreational Harvest A + B1 (Pounds)	Total Harvest	% Recreational
1981	332,000	4,115,560	4,447,560	92.5%
1982	419,656	8,337,961	8,757,617	95.2%
1983	427,919	5,750,815	6,178,734	93.1%
1984	677,615	5,381,193	6,058,808	88.8%
1985	734,370	4,305,086	5,039,456	85.4%
1986	941,006	16,906,396	17,847,402	94.7%
1987	1,157,200	8,888,780	10,045,980	88.5%
1988	1,071,014	9,301,700	10,372,714	89.7%
1989	1,016,631	6,379,327	7,395,958	86.3%
1990	873,510	5,156,173	6,029,683	85.5%
1991	1,110,344	8,105,009	9,215,353	88.0%
1992	1,012,176	7,671,228	8,683,404	88.3%
1993	698,493	5,927,022	6,625,515	89.5%
1994	459,530	3,468,111	3,927,641	88.3%
1995	375,567	4,567,378	4,942,945	92.4%
1996	355,835	3,184,899	3,540,734	90.0%
1997	280,912	2,204,038	2,484,950	88.7%
1998	254,186	1,479,759	1,733,945	85.3%
1999	208,825	2,532,690	2,741,515	92.4%
2000	247,456	3,398,346	3,645,802	93.2%
2001	305,487	2,749,702	3,055,189	90.0%
2002	351,449	5,431,147	5,782,596	93.9%
2003	339,921	2,357,938	2,697,859	87.4%
2004	294,603	3,744,085	4,038,688	92.7%
2005	265,949	2,371,990	2,637,939	89.9%
2006	349,161	4,022,144	4,371,305	92.0%
2007	337,978	4,992,623	5,330,601	93.7%
2008	311,371	3,555,198	3,866,569	91.9%
2009	242,094	3,294,180	3,536,274	93.2%
2010	241,695	3,527,764	3,769,858	93.6%

Table 2. Tautog recreational harvest (A + B1) in pounds by state, 1981-2010. 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
2009	92,613	365,406	271,803	1,310,070	489,600	392,950	123,160	225,262	23,316
2010	164,512	575,883	383,428	564,904	919,748	164,177	237,217	505,014	12,881

Table 3. Tautog commercial landings in pounds by state, 1981-2010. Source: personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD (commercial 1981 – 2009) and ACCSP Data Warehouse (2010).

	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	63,432	30,002	73,735	62,980	2,013		9,808	188
2008	73,867	48,029	20,160	88,429	63,958	1,255	4,093	11,386	194
2009	54,704	51,232	19,995	87,365	14,591	2,116	1,132	10,897	62
2010	75,317	44,104	18,607	92,407	6,553	1,763	1,211	1,699	34

Table 4. 2010 percent recreational harvest (A + B1) and commercial landings.

2010	% Commercial	% Recreational
MA	31.40%	68.60%
RI	7.11%	92.89%
CT	4.63%	95.37%
NY	14.06%	85.94%
NJ	0.71%	99.29%
DE	1.06%	98.94%
MD	0.51%	99.49%
VA	0.34%	99.66%
NC	0.27%	99.73%
Coastwide	6.41%	93.59%

Table 5. Percent of coastwide recreational harvest (A + B1), commercial landings, and total harvest by state for 2010. Source: personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD (commercial 1981 – 2009) and ACCSP Data Warehouse (2010).

	MA	RI	CT	NY	NJ	DE	MD	VA
Recreational Harvest (A + B1)	164,512	575,883	383,428	564,904	919,748	164,177	237,217	505,014
% Coastwide Recreational Harvest	4.68%	16.38%	10.91%	16.07%	26.17%	4.67%	6.75%	14.37%
Commercial Landings	75,317	44,104	18,607	92,407	6,553	1,763	1,211	1,699
% Commercial	31.2%	18.3%	7.7%	38.2%	2.7%	0.7%	0.5%	0.7%
Combined Rec Harvest & Commercial Landings	239,829	619,987	402,035	657,311	926,301	165,940	238,428	506,713
% Total Harvest	6.38%	16.50%	10.70%	17.50%	24.66%	4.42%	6.35%	13.49%

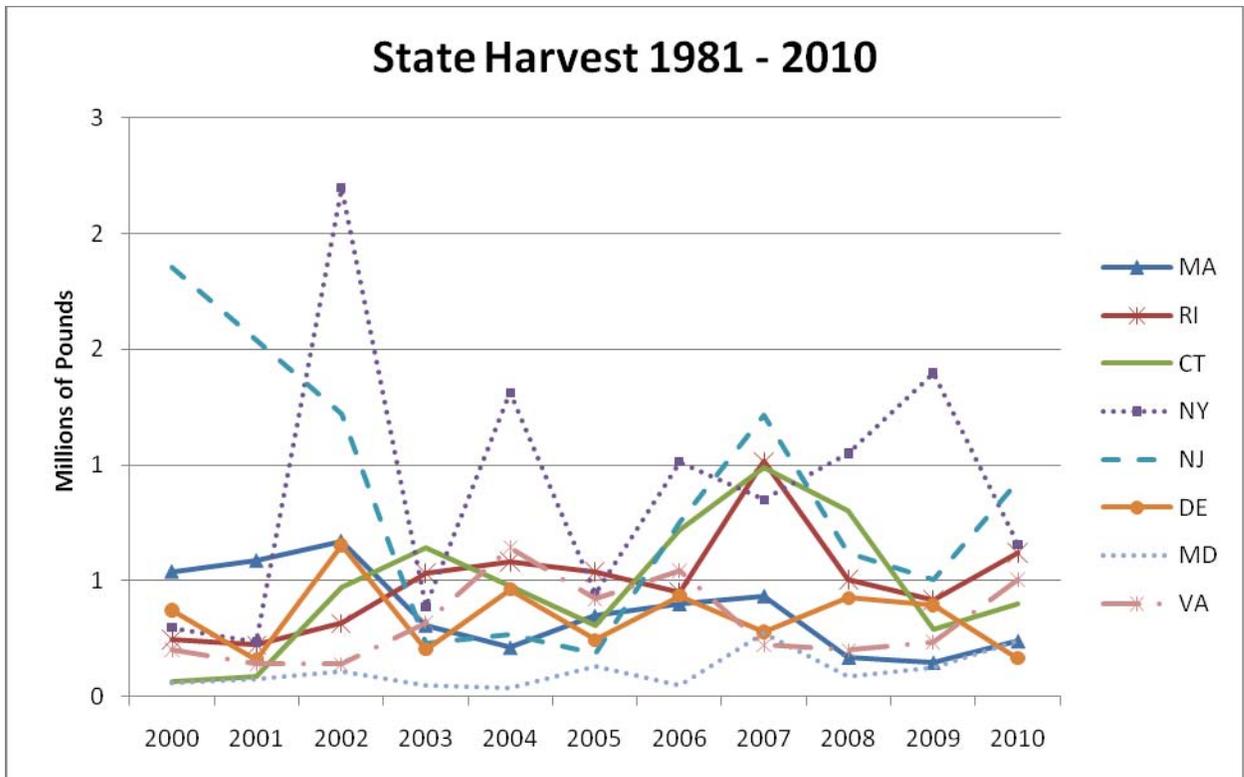


Figure 3. State harvest (recreational A + B1 and commercial landings) 2000 – 2010. Source: personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD (commercial 1981 – 2009) and ACCSP Data Warehouse (2010).

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. Table 6 lists number of samples by state in 2010 and a summary of each states monitoring program is given below. See state compliance reports for additional details.

Table 6. Number of age/length samples by state in 2010. Addendum III requires all states to collect 200 samples per year.

State	2010 Samples
MA	252
RI	278
CT	49 ⁴
NY	163
NJ	487
DE	469
MD	258
VA	187

Massachusetts:

The 2010 Massachusetts Division of Marine Fisheries (DMF) 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 252 fish.

Summary age and growth data are presented as Attachment A in Massachusetts 2010 compliance report. For a more detailed report of their current age and growth sampling see the DMF 2010 Federal Aid Progress Report Job 11. DMF also obtains some limited age and maturity samples and biomass data (stratified mean number and mean weight per tow) from their 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 2010 compliance report for a plot of the index values over time. The 2010 index plot depicts a continued decline in relative abundance but a slight increase in weight implying the mean fish size has increased and smaller fish are less abundant.

Rhode Island:

Rhode Island sampled 278 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). During 2010, mean number per tow decreased over that recorded during 2009 for the Narragansett Bay monthly trawl survey to 0.467 fish/tow. Mean weight per tow for the 2010 monthly trawl survey decreased to 0.703 kg/tow. Mean number per tow increased during the 2010 seasonal trawl survey in Narragansett Bay to

⁴ 49 samples were collected in April and May 2010 during the CT Long Island Sound Trawl Survey. Due to engine failure in the research vessel, there was no sampling for the remainder of the year.

0.235 fish/tow. Mean weight per tow decreased to 0.166 kg/tow. Indices of abundance of juvenile tautog as reported for the Narragansett Bay beach seine survey (McNamee, 2010) increased from 2009 indices to 2.23 fish/seine. Indices of abundance of juvenile tautog as reported for the RI coastal ponds beach seine survey (Lake, 2010), decreased from 2009 indices to 0.42 fish/seine.

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_
[≡](#).

There was no sampling in June 2010, so the spring index may not be comparable to the rest of the time series. The spring 2010 index of 0.25 fish per tow (geometric mean) is the eighth consecutive year the index has been below the time series mean of 0.75. Indices from 1993 to 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.

New York:

In 2010, New York State Department of Environmental Conservation (NYS DEC) conducted six monitoring trips on party boats fishing for tautog. They measured a total of 525 fish and collected 131 samples for age analysis. The size range of all fish measured from the recreational fishery was 174 mm to 578 mm total length (Figure 1 of NY's 2010 compliance report). Age samples collected from the for-hire sector were pooled with those collected from the commercial fishery to generate an age-length key (Table 1 of NY's 2010 compliance report). Thirty-two age samples were obtained from New York's commercial fishery in 2010. All samples were collected from commercial markets in October and November 2010. The age data was pooled with the recreational age data to obtain an age-length key (Table 1 of NY's 2010 compliance report). One of the dealers NY obtain samples from indicated that he was seeing less dead tautog than usual and that a greater proportion of the commercially caught tautog may be getting sold to the live market. They did not conduct any commercial monitoring trips in 2009 or 2010, however samples commercial fishery samples were obtained from commercial markets

The NYSDEC has been conducting a small mesh trawl survey targeting juvenile finfish since 1987 in the NY Finfish Trawl Survey. 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. 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. The higher CPUE in 2008 may be due to the greater availability and vulnerability of YOY tautog to the trawl gear during those months may relative to years where the survey was

conducted from May through October. The CPUE for 2009 was 1.34 but then dropped to 0.43 in 2010.

The Long Island Sound Fish Pot Study did not operate in 2009, because the vessel used for the project needed new engines. The survey did resume in 2010. In 2008, the study was expanded from 30 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 tautog were captured in the pots and ranged in size from 77 mm to 484 mm total length (Figure 3 of NY's 2010 compliance report). Three hundred and twenty nine males and five hundred and two females were identified. The sex of the remaining 2,314 fish was undetermined. Tautog 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 average monthly CPUE for the 2008 LIS tautog trap study was 4.61 tautog per trap haul. The CPUE ranged from a low of 1.34 in June to 8.08 in October (Table 3 of NY's compliance report).

In 2010, forty fish traps were deployed on June 4, and 8, 2010 between Mattituck Inlet, Mattituck NY, and Rocky Point in East Marion, NY. Efforts were made to deploy the traps near submerged rocks where tautog would be expected to be found. The traps were checked weekly weather permitting and all fish were counted and measured. The traps were removed for the season on October 14, 20 and 25, 2010. Two thousand, three hundred and fifty-three tautog were captured in the traps. The mean size was 229 mm total length with a range of 73 to 524 mm (Figure 4 of NY's 2010 compliance report). One hundred and fifteen females and 240 males were identified. The remaining 1,966 were of unknown sex. Tautog were the most numerous (2,353) fish species followed scup (931) and black sea bass (567). Nine-spine spider crabs were the most abundant invertebrate species followed by lobsters and flat clawed hermit crabs.

The highest weekly CPUE of tautog occurred during the third week of October when 255 tautog were captured in 22 traps (CPUE 11.6). The second highest weekly CPUE occurred during the second week of October when 313 tautog were caught in 33 traps (CPUE 9.48). The highest catch in a single trap was 68 tautog on October 14, 2010. The average monthly CPUE for the 2010 LIS tautog trap study was 4.26 tautog per trap haul. The CPUE ranged from a low of 2.42 in June to 9.88 in October (Table 4 of NY's 2010 Compliance Report).

New Jersey:

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. Unlike previous years where all samples were collected from party/charter vessels, some of the 2010 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 2010 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).

Delaware:

Commercial fishery landings statistics are compiled from mandatory, fisherman-reported, monthly logbook submissions to the State of Delaware. Recreational fishery statistics are estimated from the Marine Recreational Fisheries Statistics Survey (MRFSS) of the National Oceanic and Atmospheric Administration.

230 opercular bones were collected in the spring recreational charter boat spring season and 239 were collected in the fall season for constructing age-length keys and catch–curve analyses.

Fishery-independent Monitoring – 1 individual was sampled in Indian River Bay in the juvenile 16 ft. trawl survey which samples at 48 stations throughout the inland bays. The catch rate was 0.01 with a SE of 0.02.

Maryland:

In Maryland in 2010, 258 tautog were obtained by hook and line from 2 cooperating head boat captains and purchased by Maryland Department of Natural Resources (MDNR) for biological data collection. All tautog 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 229mm to 587mm, with a mean of 363mm (± 4.1) and median of 357mm for both females and males combined. Weights ranged from 288g to 5010g, with a mean of 1060g (± 38.2) and a median of 925g.

Females comprised 68% (n=174) of the samples and averaged 352mm (± 4.6 mm) with a median of 340mm (Figure 1). Mean female weight was 969g (± 42.8) with a median of 850g (Figure 2). Males made up 32% of the sampled tautog (n=83) and were longer (mean TL 387mm; ± 7.6) and weighed more (mean weight 1251g; ± 73.3) than females (Figures 1 and 2 of MD's 2010 compliance report). Age distribution of the sample for both sexes is presented in Figure 3 of MD's 2010 compliance report.

Juveniles were captured in the 2010 MDNR annual trawl and beach seine survey, components of the Investigation of Maryland's Coastal Bays and Atlantic Ocean Finfish Stocks. The survey has been conducted since 1989 and provides the only source of long term juvenile indices of tautog. 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 and location of sites, thus both the trawl and seine gears suffer from low tautog catches. Tautog were captured in 1 of 140 trawls (0.7%, 1 individual), and in 1 of 38 beach seines (2.6%, 8 individuals; Capossela et al. 2011). The trawl and beach seine CPUEs were 0.1 fish/hectare and 0.2 fish/haul, respectively. Figure 4 of MD's 2010 compliance report shows the annual relative abundance in the trawl survey from 1989-2010, and Figure 5 of MD's 2010 compliance report shows the annual relative abundance in the seine survey from the same years.

Virginia:

The Virginia Marine Resources Commission (VMRC) Biological Sampling Program collects biological data from Virginia's commercial and recreational fisheries. The lengths and weights of all samples are recorded and otoliths are removed from selected species, including tautog, for ageing. A total of 35 lengths, 35 weights, and 35 ages were taken from tautog sampled from Virginia's commercial fisheries (Table 1 of VA's 2010 compliance report). Tautog sampled from the commercial gill-net landings ranged in length from 14 to 23 inches total length (TL), with an average of 17.0 inches TL (Figure 1 of VA's 2010 compliance report). The average weight of tautog sampled from the commercial gill-net fishery was 3.68 pounds. The tautog samples collected from the commercial hook-and-line fishery ranged in length from 14.2 to 20.5 inches TL, with an average of 17 inches TL (Figure 1 of VA's 2010 compliance report). The average weight of tautog sampled from the commercial landings was 3.92 pounds.

The MRFSS program routinely samples fish encountered in its angler intercept survey to collect biological data. Samples of Type A catch are measured and weighed when possible. According to the MRFSS raw intercept data, MRFSS interviewers observed 102 tautog of Type A catch (landings) and 6 tautog of Type B1 catch (dead discards) in Virginia during 2009 (NMFS, Fisheries Statistics and Economics Division, Silver Spring, MD, pers. comm.). There were 116 tautog of Type B2 (released alive) reported. MRFSS interviewers weighed 94 of the sampled Type A catch and measured 89 tautog samples of Type A catch for length. The average weight of the Type A tautog samples was 4.19 pounds. The sampled Type A fish ranged in length from 13 to 21 inches TL, with an average length of 17.4 inches TL (Figure 3 of VA's 2010 compliance report).

The MRFSS program also conducts at-sea sampling surveys of headboat fishing trips. These surveys are the only source of biological data characterizing discarded catch (Type 9) that are collected by the MRFSS.

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 2010, there were 682 tautog tagged and 78 recaptured (from multiple years). Since 1995 there have been a total of 14,848 tautog tagged and 2,388 recaptured, with an overall recapture rate of 16.1%. 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.

The VMRC introduced its Marine Sport Fish Collection Project in June 2007. The program sets up freezers at official weigh-in stations for the Virginia Saltwater Fishing Tournament. Recreational anglers can donate their whole fish or carcasses on a voluntary basis. Anglers that donate carcasses have the opportunity to weigh their fish on one of the certified scales and provide the information along with the donated fish. The VMRC processes the donated fish for sex, length, and age. In August 2007, tautog was added to the list of species collected by the program. There were 152 tautog donated to the project in 2010. All were donated by recreational hook-and-line fishermen. A total of 152 lengths, 13 weights, and 152 ages were taken from recreational tautog donations (Table 1 of VA's 2010 compliance report). The lengths of tautog sampled from the recreational hook-and-line fishery ranged from 14.0 to 26.2 inches TL (Figure 4 of VA's 2010 compliance report). The average length of the tautog recreational fishery samples was 17.3 inches TL. The average weight of tautog sampled from the recreational fisheries was 8.51 pounds. The tautog sampled from the recreational hook-and-line fishery ranged in age from 2 to 16 years (Figure 5 of VA's 2010 compliance report).

There are currently no fishery-independent surveys in Virginia waters that observe sufficient quantities of tautog to be considered adequate for monitoring species trends.

North Carolina:

A large extent of fishery-dependent sampling occurs in North Carolina each year. However, due to the extremely low number of total commercial fishery trips containing tautog landings, no tautog were measured from the commercial harvest in 2010.

No tautog were recorded in any of the fishery-independent finfish surveys in 2010. No surveys are specifically designed to sample tautog. A few juvenile tautog have been captured sporadically in an annual juvenile finfish estuarine trawl survey operated in May and June, but no tautogs have been caught in the survey since 2001.

VI. Status of Management Measures and Issues⁵

The Interstate Fishery Management Plan for Tautog specifies a 14” minimum size limit for the recreational and commercial fishery and requires the use of degradable fasteners on fish pots and traps⁶. Addendum III requires all states to collect 200 age/length samples 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. Addendum IV & V specify 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

With the implementation of Addendum IV, states were required to implement new regulations to meet $F = 0.20$ by January 1, 2008. Massachusetts and Rhode Island submitted a regional VPA analysis showing that their regional F was lower than the coastwide average ($F = 0.22$ in 2004 and $F = 0.11$ in 2005), only requiring a 12% reduction to meet $F = 0.20$. The Technical Committee (TC) reviewed and endorsed the MA/RI proposal, and the Board allowed Massachusetts and Rhode Island to only reduce harvest by 12%. All other states were required to implement the full 25.6% exploitation reduction required by Addendum IV & V. All states implemented new regulations in 2008.

All states in the management unit submitted 2010 compliance reports. Summary tables of state regulations are on page 26 & 27 in Table 7 & 8. ***The Plan Review Team (PRT) reviewed the reports and find that all states meet or exceed the regulatory requirements of the FMP.***

Virginia was the only state to modify commercial fishery regulations in 2010. In 2008 and 2009, Virginia’s commercial fishing season for tautog was closed from April 16 through October 2 and from December 1 through December 15. Effective April 1, 2010, Virginia’s commercial fishing season for tautog was closed from May 1 through November 12. The dates of the new closure were among the options reviewed by the TC and approved by the Board for reducing harvest exploitation in Virginia’s commercial sector as required by Addendum IV & V.

Commercial harvest (75,317 pounds) in Massachusetts exceeded the 64,753 pound quota and the 2011 quota will be reduced by the overage amount, and set at 54,189 pounds.

⁵ Does not include the recently approved Addendum VI, which will not be implemented until 2012.

⁶ Hinges or fasteners on one panel or door must be made of either untreated hemp, jute or cotton string of 3/16” (4.8 mm) or smaller; magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or ungalvanized or uncoated iron wire of 0.094” (2.39 mm) or smaller.

In 2010, Rhode Island voluntarily decreased its fall recreational fishery bag limit to 6 fish per person per day and also implemented a 10 fish per vessel maximum for the recreational mode. The party and charter modes are exempted from the 10 fish vessel limit, but have a mandatory logbook reporting requirement.

Most states collected 200 or more age/length samples in 2010 as required by Addendum III. Connecticut collected 49 age/length samples in April and May of 2010, but their sampling efforts were cut short by engine failure in their research vessel. New York (163) and Virginia (187) did not collect the full 200 samples as specified in the Addendum III, but both states did collect a significant amount of samples to support the coast-wide stock assessment. *As such, the PRT finds that all states meet (or tried to meet) the intent of the Addendum III sampling requirements and recommend the Board find all states in compliance with the sampling requirements of the FMP.* The PRT

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. 2010 commercial landings total 241,695 pounds and 1% of this total is 2,417 pounds. Therefore the threshold for *de minimis* status in 2010 is 10,000 pounds because this amount is larger than 2,417 pounds. States must request *de minimis* status each year and requests for *de minimis* status will be reviewed by the PRT 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. If granted *de minimis* status, a state must still collect 200 age/length samples as required in Addendum III. *De minimis* status does not impact a state's compliance requirements in the recreational fishery.

The states of Delaware (1,763 commercial pounds in 2010) and North Carolina (34 commercial pound in 2010) have requested de minimis status for the 2010 fishing season. Both of these states meet or exceed the criteria, and the PRT recommends that the Board approve their requests.

VIII. Prioritized Research Needs⁷

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.

⁷ Does not include recommendations from the 2011 Assessment Update that was not available in 2010.

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 7. 2010 Commercial Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS	QUOTA	GEAR RESTRICTIONS
Massachusetts	16"	40	April 14-May 16 Sept 1-Oct 31	64,753 pounds	Yes
Rhode Island	16"	10 per vessel per day	Apr 15 - May 30 Aug 1 - Sept 15 Oct 15 - Dec 31	42,711 pounds	Yes
Connecticut	14"	a	Jan 1-Apr 30 June 15 - Aug 31 Oct 15 - Dec 6		Yes
New York	14"	b	Jan 1 - Feb 28 Apr. 8 -Dec 30		Yes
New Jersey	14"		Jan 1 - 15 June 5 - 30 Nov 1 - Dec 31		Yes
Delaware	14"	10	Jan 1 - Mar 31		Yes
	15"	3	Apr 1 - May 11		
	14"	10	July 1 - Aug 31		
	14"	10	Sept 29 - Dec 31		
Maryland	14"	4	Jan 1 - May 15		Yes
		2	May 16 - Oct 30		
		4	Nov 1 - 30		
Virginia*	14"		Jan 1 - Apr 30 Nov 12 - Dec 31		

a (1) in the trawl fishery, 50 fish; (2) in the hook, fish pot, trap net, fyke net, or gill net fisheries, 25 fish; (3) in the pound net fishery, 12 fish; and (4) in the lobster pot fishery, 10 fish.

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.

* Virginia adjusted their commercial seasons in 2010. Previously, their commercial fishery was closed from April 16 through October 2 and from December 1 through December 15.

Table 8. 2010 Recreational Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS
Massachusetts	16"	3	Jan 1 – Dec 31
Rhode Island	16"	3	Apr 15 - May 31
	16"	3	July 1 - Oct 16
	16"	6*	Oct 17- Dec 15
Connecticut	14"	4	Jan 1-Apr 30
	14"	2	July 1 - Aug 31
	14"	4	Oct 1 - Dec 6
New York	14"	4	Jan 17 - Apr 30
	14"	4	Oct 1 - Dec 20
New Jersey	14"	4	Jan 1 - Apr 30
	14"	1	July 16 - Nov 15
	14"	6	Nov 16 - Dec 31
Delaware	14"	10	Jan 1 - Mar 31
	15"	3	Apr 1 - May 11
	14"	10	July 1 - Aug 31
	14"	10	Sept 29 - Dec 31
Maryland	14"	4	Jan 1- May 15
		2	May 16 - Oct 30
		4	Nov 1 - 30
Virginia	14"	4	Jan 1 - Apr 30
		4	June 25 - Dec 31

* RI decreased its fall recreational fishery bag limit to 6 fish per person per day and also implemented a 10 fish per vessel maximum. Party and charter modes are exempted from the vessel limit, but had a mandatory logbook reporting requirement.