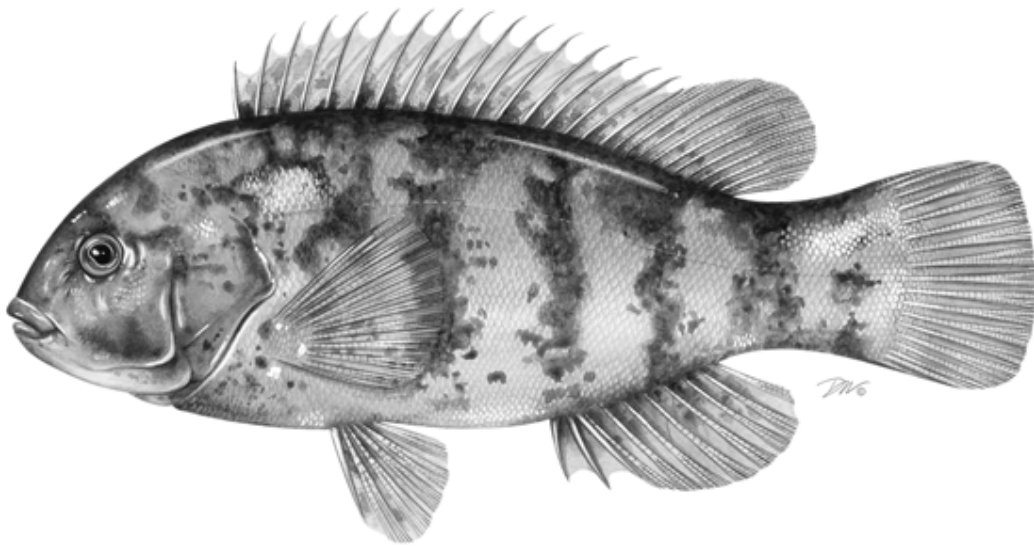


2009 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR
TAUTOG
(Tautoga onitis)



Prepared by:
Tautog Plan Review Team

Board Approve June 2011

**2009 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 Summary¹

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.² 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 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.

II. Status of Stocks³

Overfishing definition: $F_{rebuild} = 0.20$

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 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 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*.

³ Does not include results of the 2011 Stock Assessment which was not available during the 2009 fishing season.

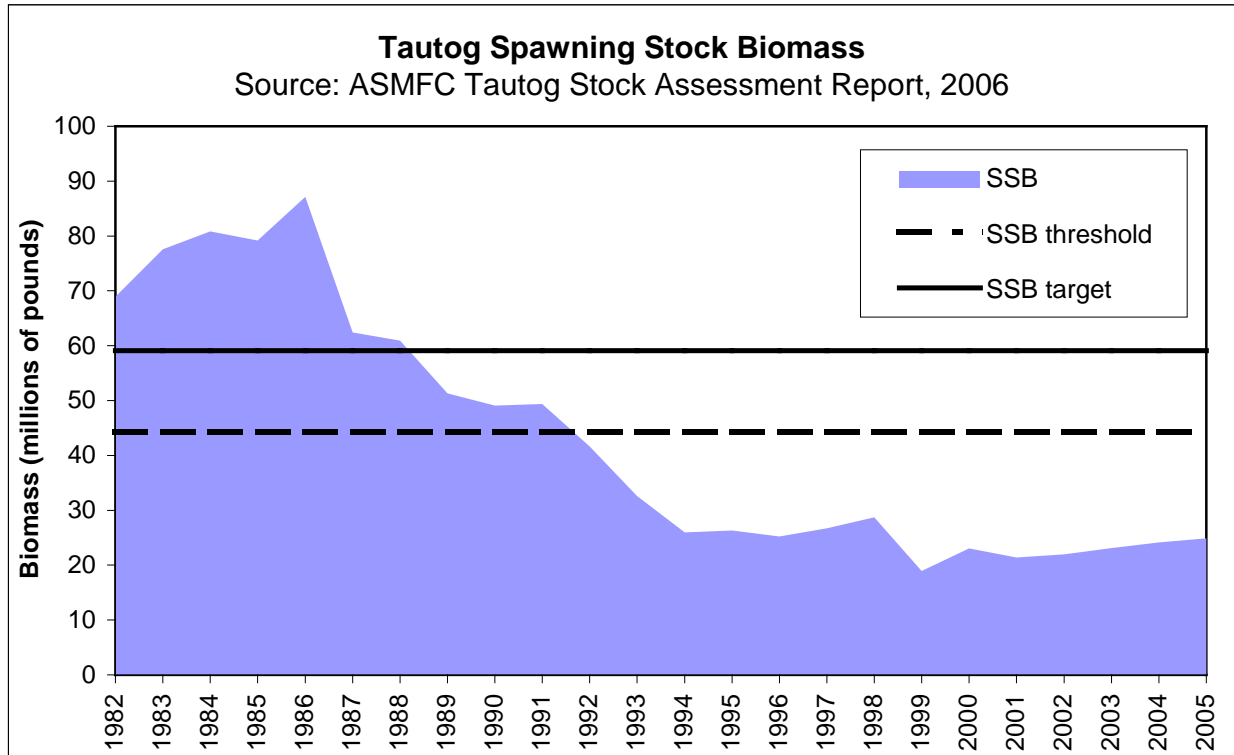


Figure 1. Tautog SSB 1982 – 2005. Source: 2006 ASMFC Tautog Stock Assessment Report.

III. Status of Assessment Advice⁴

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.

⁴ Does not include results of 2011 Assessment Update that was not available in 2009.

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 total landings in recent years (Table 1). 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 3.5 million pounds in 2009. Commercial landings totaled 242,094 pounds in 2009 accounting for only 7% of total coastwide harvest.

New York had the largest recreational harvest of any state (1,310,070 pounds) accounting for 40.5% of 2009 coastwide recreational harvest. New Jersey (489,600 lbs), Delaware (392,950 lbs), and Rhode Island (365,406 lbs) also had significant recreational harvest accounting for 15.0%, 12.0%, and 11.2% of coastwide recreational harvest, respectively (Table 5).

New York also had the most significant commercial landings of any state (87,365 lbs) accounting for 36.10% of coastwide commercial landings, while Massachusetts (54,704 lbs) and Rhode Island (51,432) also landed 22.6 and 21.17% of the coastwide commercial landings (Table 5).

New York (39.8%), New Jersey (14.4%), Rhode Island (11.9%), and Delaware (11.3%) had the most significant total harvest (recreational harvest and commercial pounds) in 2009 (Table 5).

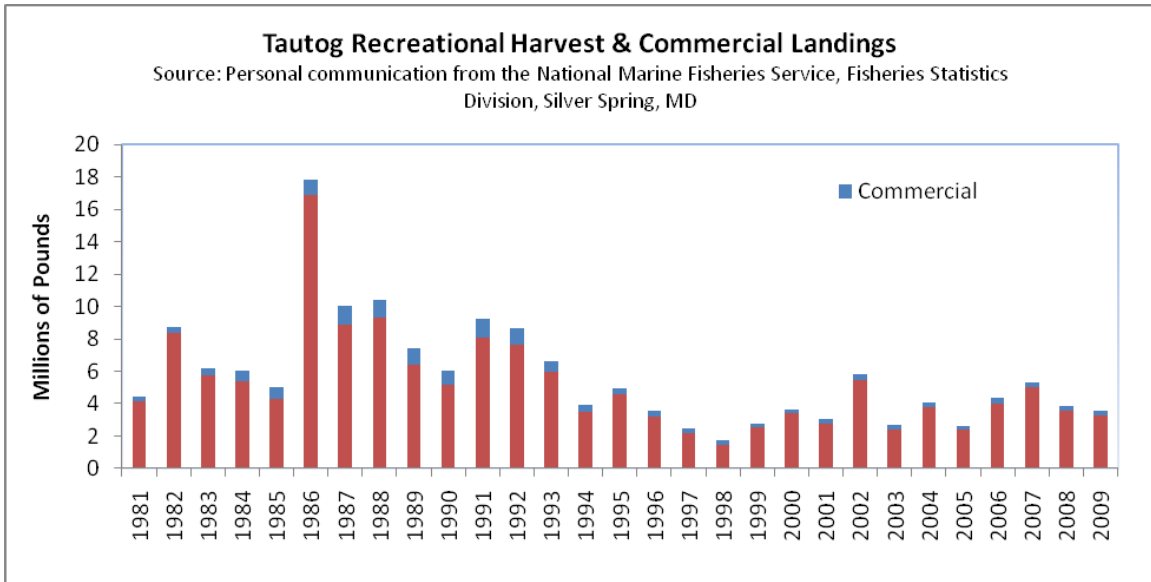


Figure 2: Tautog Recreational and Commercial Landings from 1981 – 2009. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

Table 1. Tautog commercial landings, recreational harvest, total harvest (recreational harvest + commercial landings), and % recreational harvest 1981 - 2009. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

	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%

Table 2. Tautog recreational harvest (A + B1) in pounds by state, 1981-2009. 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

Table 3. Tautog commercial landings in pounds by state, 1981-2009. 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	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

Table 4. 2009 percent recreational harvest (A + B1) and commercial landings.

2009	% Commercial	% Recreational
MA	37.13%	62.87%
RI	12.30%	87.70%
CT	6.85%	93.15%
NY	6.25%	93.75%
NJ	2.89%	97.11%
DE	0.54%	99.46%
MD	0.91%	99.09%
VA	4.61%	95.39%
NC	0.27%	99.73%
Coastwide	6.8%	93.2%

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

	MA	RI	CT	NY	NJ	DE	MD	VA
Recreational Harvest (A + B1)	92,613	365,406	271,803	1,310,070	489,600	392,950	123,160	225,262
% Coastwide Recreational Harvest	2.83%	11.17%	8.31%	40.05%	14.97%	12.01%	3.77%	6.89%
Commercial Landings	54,704	51,232	19,995	87,365	14,591	2,116	1,132	10,897
% Commercial	22.60%	21.17%	8.26%	36.10%	6.03%	0.87%	0.47%	4.50%
Combined Rec. Harvest & Com. Landings	147,317	416,638	291,798	1,397,435	504,191	395,066	124,292	236,159
% Total Harvest	4.19%	11.86%	8.31%	39.78%	14.35%	11.25%	3.54%	6.72%

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 2009 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 2009. Addendum III requires all states to collect 200 samples per year.

State	2009 Samples
MA	271
RI	317
CT	157
NY	183
NJ	505
DE	445
MD	179
VA	198

Massachusetts:

The 2009 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 271 fish.

Massachusetts 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. The 2009 index plot depicts a substantial decline in relative abundance but only a slight decline by weight implying the mean fish size has increased and smaller fish are less abundant.

Rhode Island:

Rhode Island sampled 317 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 2009, mean number per tow increased over that recorded during 2008 for the Narragansett Bay monthly trawl survey to 0.86 fish/tow. Mean weight per tow for the 2009 monthly trawl survey increased to 1.36 kg/tow. Mean number per tow decreased during the 2009 seasonal trawl survey in Narragansett Bay to 0.18 fish/tow. Mean weight per tow decreased to 0.33 kg/tow (Olszewski, 2009). The data is presented in the table below.

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

≡]. The spring 2009 index of 0.40 fish per tow (geometric mean) is the seventh consecutive year the index has been below the time series mean of 0.76. 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 2009, New York Department of Environmental Conservation conducted eleven monitoring trips on party boats fishing for blackfish. They measured a total of 1030 fish and collected 183 samples for age analysis. The size range of all fish measured from the recreational fishery was 127 mm to 620 mm total length.

The Long Island Sound Fish Pot Study did not operate in 2009, because the vessel used for the project needed new engines. In 2007, the New York State Department of Environmental Conservation (NYSDEC) 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 & 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. 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 3rd 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 Long Island Sound Fish Pot 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. 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 average 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.

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, obtaining 505 racks. Unlike previous years where all samples were collected from party/charter vessels, some of the 2009 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 2009 New Jersey recreational fishery.

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. 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 215 were collected in the fall season for constructing age-length keys and catch-curve analyses. 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 0.02 with a SE of 0.02.

Maryland:

In Maryland in 2009, 179 tautogs were captured in fish pots by commercial fishermen and purchased by Maryland Department of Natural Resources (DNR) for biological data collection. 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 251mm to 643mm, with a mean of 358mm (± 5.3) and median of 340mm for both females and males combined. Weights ranged from 288g to 5010g, with a mean of 964g (± 55.0) and a median of 733g.

Females comprised 60% (n=108) of the samples and averaged 340mm (± 5.6 mm) with a median of 333mm (Figure 1). Mean female weight was 803g (± 50.7) with a median of 680g (Figure 2). Males made up 40% of the sampled tautogs (n=71) and were longer

(mean TL 384mm; ± 9.5) and weighed more (mean weight 1208g; ± 109.6) than females (Figures 1 and 2). Age distribution of the sample is presented in Figure 3.

Juveniles were captured in the 2009 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 1 of 140 trawls (0.7%, 1 individual), and in 1 of 38 beach seines (2.6%, 1 individual; Bolinger et al. unpublished). The trawl and beach seine CPUEs were 0.06 fish/hectare and 0.03 fish/haul, respectively. Figure 4 shows the annual relative abundance in the trawl survey from 1989-2009, and Figure 5 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 60 lengths, 60 weights, and 58 ages were taken from tautog sampled from Virginia's commercial fisheries.. Tautog sampled from the commercial gill-net landings ranged in length from 14.2 to 21.9 inches total length (TL), with an average of 17.0 inches TL. 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 16.8 inches TL. The average weight of tautog sampled from the commercial hook-and-line landings was 3.50 pounds.

Tautog ranging in age from 2 to 15 years were observed in the commercial fisheries samples (Figure 2). Though sample sizes were small, most of the tautog collected from the commercial gill-net fishery were 3 to 8 years old. Most of the tautog sampled from the commercial hook-and-line landings were 3 to 5 years old.

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 lb. The sampled Type A fish ranged in length from 13 to 21 inches TL, with an average length of 17.4 inches TL.

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. MRFSS observers reported there were 7 tautog discarded during headboat surveys in Virginia in 2009 (NMFS, pers. comm.). All discarded tautog were thrown back alive, according to the raw data records. A total of 7 of the discarded tautog were available for measuring. These fish ranged from 9 to 13 inches TL.

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 2009, there were 522 tautog tagged and 38 recaptured (from multiple years). Since 1995 there have been a total of 14,128 tautog tagged and 2,239 recaptured, with an overall recapture rate of 15.8%. 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. All scales at these locations are certified by VMRC staff. 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 148 tautog donated to the project in 2009. All were donated by recreational hook-and-line fishermen. A total of 148 lengths, 29 weights, and 140 ages were taken from recreational tautog donations (Table 1). The lengths of tautog sampled from the recreational hook-and-line fishery ranged from 14.0 to 30.9 inches TL. 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 5.51 pounds. The tautog sampled from the recreational hook-and-line fishery ranged in age from 3 to 19 years. The average age of these samples was 6 years.

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. Participating anglers shared information on seven tautog caught in 2009. Five of the reported tautog were classified as kept fish and averaged 18 inches in length. The remaining two tautog were classified as released. The released fish averaged 13 inches in length.

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 2009.

No tautog were recorded in any of the fishery-independent finfish surveys in 2009. 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 Issues

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 traps⁵. 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. 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.

⁵ 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.

All states in the management unit submitted 2009 compliance reports. *The PDT reviewed all proposals and found that there were no major regulatory changes in 2009. In addition, most states collected 200 or more age/length samples as required by Addendum III. Connecticut (157), New York (183), Maryland (179), and Virginia (198), did not collect the full 200 as required, but these states did collect a significant amount of samples to support the coast-wide stock assessment. As such, the PDT finds that these states meet the intent of the Addendum III sampling requirements.*

Commercial quotas were reduced slightly in Massachusetts and Rhode Island in 2009 to account for overages during the 2008 fishing season. Table 6 & 7 show 2009 state 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. 2009 commercial landings total 242,094 pounds and 1% of this total is 2,421 pounds. Therefore the threshold for *de minimis* status in 2010 is 10,000 pounds because this amount is larger than 2,421 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 states compliance requirements in the recreational fishery.

The states of Delaware (2,098 commercial pounds in 2009) and North Carolina (61 commercial pound in 2009) have requested de minimis status for the 2010 fishing season. Both of these states meet or exceed the criteria, and the PDT recommends that the Board approve their requests.

VIII. Prioritized Research Needs⁶

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.

⁶ Does not include recommendations from the 2011 Assessment Update that was not available in 2009.

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 6. 2009 Commercial Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS	QUOTA	GEAR RESTRICTIONS
Massachusetts	16"	40	April 14-May 16 Sept 1-Oct 31	55,714 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" 15" 14" 14"	10 3 10 10	Jan 1 - Mar 31 Apr 1 - May 11 July 1 - Aug 31 Sept 29 - Dec 31		Yes
Maryland	14"	4 2 4	Jan 1 - May 15 May 16 - Oct 30 Nov 1 - 30		Yes
Virginia	14"		Jan 1 - Apr 15 Oct 3 - Nov 31 Dec 16 - 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.

Table 7. 2009 Recreational Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS
Massachusetts	16"	3	-
Rhode Island	16"	3	Apr 15 - May 31
	16"	3	July 1 - Oct 16
	16"	8	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