

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

2018 Fishing Year
(January 1 – December 31)



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TAUTOG (*Tautoga onitis*)
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Management Summary

<u>Management Documents:</u>	Fishery Management Plan - March 1996 Addendum I to FMP (May 1997) Addendum II to FMP (November 1999) Addendum III to FMP (February 2002) Addendum IV to FMP (January 2007) Addendum V to FMP (August 2007) Addendum VI to FMP (March 2011, revised March 2012) Amendment 1 to FMP (October 2017)
<u>Management Unit:</u>	US state waters from Massachusetts through Virginia ¹ .
<u>Declared Interest:</u>	Massachusetts Rhode Island Connecticut New York New Jersey Delaware Maryland Virginia National Marine Fisheries Service U.S. Fish & Wildlife Service
<u>Active Boards/Committees:</u>	Tautog Management Board (Board) Tautog Plan Development Team (PDT) Tautog Plan Review Team (PRT) Tautog Technical Committee (TC) Tautog Stock Assessment Subcommittee (SAS) Tautog Advisory Panel (AP)
<u>Stock Assessments:</u>	Benchmark: 1999, 2005, 2015 Update: 2011 (revised in 2012), 2016

¹ North Carolina was originally included in the management unit, but as of 2017 was removed due to insignificant landings. North Carolina's landings will continue to be monitored.

I. Status of Fishery Management Plan

Fishery Management Plan for Tautog

The original FMP responded to concerns about the vulnerability of tautog to overfishing and increasing fishing pressure in the early 1990s. It established goals and objectives for tautog management, and adopted a fishing mortality rate (F) target of 0.15 to rebuild the stocks and prevent overfishing; however, an interim target of 0.24 was applied for two years (1997–1998). States were required to implement state-specific, Board-approved plans to reduce F from the coastwide average of 0.58 (i.e., a 55% reduction), or an alternative state-specific F, if it could be demonstrated as equivalent. Recreational and commercial minimum size limits of 13" in 1997 and 14" beginning in 1998 were required. Tautog pots and traps were also required to have degradable fasteners on one panel or door.

Addendum I

Addendum I modified the FMP's compliance schedule to allow all states until April 1, 1998 to implement management measures to reach the interim F target. Several states were having difficulty determining a state-specific F to meet the original compliance schedule due to data deficiencies. In addition, the compliance schedule implemented the interim F target one year earlier in the area north of Delaware Bay (April 1, 1997) than further to the south (April 1, 1998). The addendum also delayed the implementation of management measures to achieve the permanent F target from April 1, 1999 to April 1, 2000. Finally, the Addendum included *de minimis* requirements and corrected several typographical errors in the FMP.

Addendum II

Addendum II further extended the compliance schedule to achieve the permanent F target until April 1, 2002 because the effects of the regulations to achieve the interim F target were uncertain. It also listed four issues to be considered in subsequent revisions of the FMP: (1) development of alternative F targets that will allow states to quantify harvest reductions associated with a variety of management approaches, (2) clarification of the F targets to be met by sector or overall state program, (3) monitoring requirements to improve fisheries and biological data collection, and (4) data requirements to analyze management options by fishing modes within commercial and recreational fisheries.

Addendum III and Technical Addendum I

Addendum III addressed the four issues listed in Addendum II. It adopted a new F target based on achieving 40% of the spawning stock biomass ($F_{40\% SSB}$), which was estimated at 0.29 (compared to the coastwide average F estimate of 0.41). The addendum required states to maintain current or more restrictive measures for 2002 and implement measures to achieve the new F target—a 48% reduction through restrictions in the recreational fishery only—by April 1, 2003. It also updated information on tautog habitat and established monitoring requirements to support stock assessments. Technical Addendum 1 corrected a typographical error in Addendum III.

Addendum IV

Addendum IV established SSB target and threshold reference points based on a benchmark stock assessment completed in 2005. The target was set as the average SSB over 1982–1991, and the threshold at 75% of this value. It also set a new F target of 0.20 to initiate rebuilding. States were required to implement recreational management programs to achieve a 28.6% reduction in F relative to 2005 (and maintain existing commercial management programs) by January 1, 2008.

Addendum V

As individual states developed management proposals to comply with Addendum IV's mandated reduction in fishing mortality, it became apparent that commercial harvest of tautog had grown in proportion to the recreational fishery in some states. The Board approved Addendum V to give states flexibility for implementing reductions in their recreational *and/or* commercial fisheries to reach the fishing mortality target rate of $F = 0.20$ established in Addendum IV by January 1, 2008.

Addendum VI

Based on the 2011 stock assessment update indicating that tautog were still overfished and experiencing overfishing, Addendum VI reduced the F target to 0.15 to rebuild the stock. States were required to implement Board-approved regulations in their commercial and/or recreational fisheries to reduce harvest by 39%. The addendum also allowed for regional considerations if a state or group of states could demonstrate that the local F is below the rates indicated in the stock assessment update.

Amendment 1

Amendment 1 replaced the original FMP, with an implementation date of April 1, 2018 for most measures. Major revisions to the FMP include: new goals and objectives, establishment of four tautog stocks for regional recreational and commercial management, and creation of a commercial harvest tagging program (implementation in 2020).

Goals:

- To sustainably manage tautog over the long-term using regional differences in biology and fishery characteristics as the basis for management.
- To promote the conservation and enhancement of structured habitat to meet the needs of all stages of tautog's life cycle.

Objectives:

- To develop and implement management strategies to rebuild tautog stocks to sustainable levels (reduce fishing mortality to the target and restore spawning stock biomass to the target), while considering ecological and socio-economic impacts.
- To adopt compatible management measures among states within a regional management unit.
- To encourage compatible regulations between the states and the EEZ, which includes enacting management recommendations that apply to fish landed in each state (i.e., regulations apply to fish caught both inside and outside of state waters).

- To identify important habitat and environmental quality factors that support the long-term maintenance and productivity of sustainable tautog populations throughout their range.
- 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.
- To work with law enforcement to minimize factors contributing to illegal harvest.

Regional Management: Based on the 2016 regional stock assessment, Amendment 1 delineates the stock into four regions due to differences in biology and fishery characteristics: Massachusetts - Rhode Island (MARI); Long Island Sound (LIS); New Jersey - New York Bight (NJ-NYB); and Delaware - Maryland - Virginia (DelMarVa). The four regions are required to implement measures to achieve the regional fishing mortality target with at least a 50% probability.

The 2016 assessment found that all regions except MARI were overfished, and overfishing was occurring in the LIS and NJ-NYB regions in 2015. As such, Amendment 1 requires the LIS region to reduce harvest by at least 20.3%, and the NJ-NYB region to reduce harvest by at least 2%. The MARI and DelMarVa regions were not required to reduce harvest, but established regional measures.

Commercial Harvest Tagging Program: Amendment 1 also establishes a commercial harvest tagging program to address an illegal, unreported and undocumented fishery. Implementation of the program is scheduled for 2020.

II. Status of the Stocks

Current stock status is based on the 2016 stock assessment update. The assessment evaluates each of the four regions—MARI, LIS, NJ–NYB, and DelMarVa—separately using the ASAP statistical catch-at-age model with landings and index data through 2015. The assessment update indicated that all regions except MARI were overfished in 2015. It also found overfishing was occurring in the LIS and NJ-NYB regions in 2015. Overfishing was not occurring in the MARI nor DelMarVa regions. F was at the target in the DelMarVa region. The current overfishing and overfished definitions for management use are shown in Table 1, and spawning stock biomass (SSB) for each region relative to the respective targets and thresholds are shown in Figures 1-4. It is important to note that the status determinations were made using spawning potential ratio (SPR) reference points for the MARI, NJ-NYB and DelMarVa regions, and maximum sustainable yield (MSY) reference points for the LIS region.

III. Status of Assessment Advice

The current reference points for this fishery are based on a regional stock assessment update that includes data through 2015. The peer review panel in the 2005 and 2015 benchmark stock assessments advised a regional approach for tautog because of the potential for sub-stock structure; this species does not appear to make north-south migrations. The 2015 benchmark stock assessment peer review panel also endorsed the use of estimates from the ASAP regional model and supported use of the new reference points in conjunction with a regional management approach. A regional approach with new reference points has been adopted for management use through Amendment 1.

Since the last assessment, NOAA Fisheries has implemented improvements to the Marine Recreational Information Program's survey methodology for estimating recreational catch. A multi-year transition of the methods was completed in 2018, requiring the catch estimates for 1981–2017 to be calibrated for comparison to all subsequent years' estimates. Changes to the original 1981–2017 catch estimates are significant; for example, annual coastwide harvest (by weight) increased in all years—by 27% to 323%—after calibration. The next tautog stock assessment, tentatively scheduled as an update in 2021, will include the revised time series of recreational catch estimates. ***All recreational catch estimates included in this report reflect the current MRIP survey methodology.***

IV. Status of the Fishery

Total Harvest

Between 1981 and 2018², total coastwide tautog harvest (recreational + commercial) peaked at 22.5 million pounds in 1986. Harvest has since significantly declined, even before state regulations were implemented to restrict them. Total harvest during the ASMFC managed period (1997–2018) has averaged 7.5 million pounds per year (Figure 5, Table 2).

Recreational Harvest

Tautog is predominantly taken by the recreational fishery: 95% on average, by weight (Table 2). Coastwide, anglers harvested historic highs of over 21 million pounds of tautog in 1986 and 1992 (Figure 5). Since then, harvest has declined, fluctuating between 3.4 million pounds (in 2018) and 11.8 million pounds (in 2014). Most recreational harvest occurs in September–December (Figure 6). At the state level, Rhode Island and New Jersey anglers harvested the most tautog in 2018 (Tables 4 and 5) though high harvesting states have varied significantly in recent years (Figure 7).

Recreational live discards have generally increased relative to harvest over the time series. Prior to the FMP's implementation in 1996, discards were usually less than harvest, but since then the estimated number of fish discarded annually has been several times greater than the harvested number (Table 4). In 2018, live discards were nine times the estimated harvest. A

² Systematic recreational data collection for tautog began in 1981, while commercial data exists back to 1950.

discard mortality rate of 2.5% is assumed for the recreational tautog fishery, resulting in an estimated 239,252 recreational dead discards in 2018. This equates to 18% of recreational removals.

Commercial Landings

Historically, tautog was considered a “trash fish” until the late 1970s, when demand increased, and a directed commercial fishery developed. Landings quickly rose, peaking in 1987 at nearly 1.2 million pounds, then rapidly began to decline. In 1992, states began to implement commercial regulations, which contributed to a decline in landings (Figure 8, Table 2). The price (dollars per pound) for tautog has steadily increased since the late 1970s. In 2018, the coastwide average price reached \$3.98 per pound (Figure 8).

Commercial landings accounted for 5% of total coastwide harvest in 2018. In some states commercial landings were more significant, e.g., 25% of New York’s total 2018 harvest (Table 3). New York also had the most commercial landings of tautog in 2018, with Massachusetts landing the second greatest amount (Table 6). Data on commercial discards are not available.

V. Status of Research and Monitoring

Addendum III requires all states to collect the following data to continue support of a coast-wide stock assessment: commercial and recreational catch estimates, and 200 age and length samples per state, within the range of lengths commonly caught by the fisheries³. Table 9 lists the number and source of samples collected by states in 2018.

Ongoing fishery-independent and fishery-dependent monitoring programs performed by each state are summarized in Tables 10 and 11, respectively. Details of monitoring results are found in the state compliance reports.

VI. Status of Management Measures and Issues

Amendment 1 to the Tautog Fishery Management Plan was approved by the Board in October 2017. All measures within the plan, including regional management programs, have been implemented as of January 2018 with the exception of the commercial tagging program. The commercial tagging program is currently being developed by state and ASMFC staff and has a tentative implementation date of January 1, 2020.

³ Addendum III also required a suitable time series of fisheries independent indices of abundance as determined by the Tautog Technical Committee; however, the TC has not defined this and as such there are no fishery independent monitoring requirements.

VII. Implementation of FMP Compliance Requirements

A. Submission of Compliance Report

All states in the tautog management unit submitted state compliance reports for the 2018 fishing year.

B. De Minimis Status Requests

A state may apply for *de minimis* status with regards to its commercial fishery. To qualify for *de minimis* status a state must prove that its commercial landings in the most recent year for which data are available did not exceed 10,000 pounds or 1% of the regional commercial landings, whichever is greater. 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.

If *de minimis* status is granted, the *de minimis* state is required to implement the commercial minimum size provisions, the pot and trap degradable fastener provisions, and regulations consistent with those in the recreational fishery (including possession limits and seasonal closures). The state must monitor its landings on at least an annual basis. If granted *de minimis* status, a state must continue to collect the required 200 age/length samples. *De minimis* status does not impact a state's compliance requirements in the recreational fishery.

The commercial landings threshold for *de minimis* status for 2018 in each region is 10,000 pounds. The states of Delaware and Maryland have requested and qualify for continued *de minimis status* for the commercial sector. The PRT recommends that the Board approve the states of Delaware and Maryland's requests.

C. Regulatory Requirements: 14" minimum size limit for recreational and commercial fisheries; degradable fasteners on one panel or door in fish pots and traps; and regional management programs to achieve the required regional target F.

State regulations are summarized in Tables 7 and 8. Nearly every state adjusted their commercial and recreational measures to comply with the provisions of Amendment 1. The PRT finds that each state has met the regulatory requirements and recommends the Board find all states in compliance with the regulatory requirements.

D. Biological Sampling Requirements: commercial and recreational catch estimates; and 200 age/length samples (Addendum III)

Nearly all states collected 200 or more age/length samples in 2018 as required by Addendum III (Table 9). New York, Delaware and Virginia fell short of the required number of samples, with 148, 134, and 26 samples, respectively. New York noted difficulty in obtaining samples from fish markets at times because the racks were being sold. In past years, NYSDEC had been able to obtain samples via contractor; however, the agreement ended in June 2017 and has not been

renewed. In Virginia, much of samples are collected through a donation freezer as part of the Marine Sportfish Collection program. In 2018, the marina where the donation freezer was located closed and freezer was removed, significantly reducing the number of samples collected. Delaware indicated they have been challenged to collect 200 samples from the recreational fishery due to less cooperation in receiving donated fish from recreational for-hire trips.

The PRT finds that all states met (or tried to meet) the intent of the sampling requirements and recommends the Board find all states in compliance with the sampling requirements of the FMP. Additionally, the PRT noted the need to maintain the 200 sample requirement as the Technical Committee has indicated this is the minimum number of samples needed.

VIII. Prioritized Research Needs

The Technical Committee identified the following research recommendations to improve the stock assessment and our understanding of tautog population and fishery dynamics. Research recommendations are organized by topic and level of priority. Research recommendations that should be completed before the next benchmark assessment are underlined. The Technical Committee will update these recommendations as part of the next benchmark stock assessment.

8.1 Fishery-Dependent Priorities

High

- Expand biological sampling of the commercial catch for each gear type over the entire range of the stock (including weight, lengths, age, sex, and discards).
- Continue collecting opercula from the tautog catch as the standard for biological sampling in addition to collecting paired sub-samples of otoliths and opercula.
- Increase catch and discard length sampling from the commercial and recreational fishery for all states from Massachusetts through Virginia.
- Increase collection of effort data for determining commercial and recreational CPUE.
- Increase MRIP 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 in early spring and late fall when tautog catches are more likely.

8.2 Fishery-Independent Priorities

High

- Conduct workshop and pilot studies to design a standardized, multi-state fishery independent survey for tautog along the lines of MARMAP and the lobster ventless trap survey.
- Establish standardized multi-state long-term fisheries-independent surveys to monitor tautog abundance and length-frequency distributions, and to develop YOY indices.
- Enhance collection of age information for smaller fish (<20 cm) to better fill in age-length keys

8.3 Life History, Biological, and Habitat Priorities

Moderate

- Define local and regional movement patterns and site fidelity in the southern part of the species range. This information may provide insight into questions of aggregation versus recruitment to artificial reef locations, and to clarify the need for local and regional assessment.
- Assemble regional reference collections of paired operculum and otolith samples and schedule regular exchanges to maintain and improve the precision of age readings between states that will be pooled in the regional age-length keys.
- Calibrate age readings every year by re-reading a subset of samples from previous years before ageing new samples. States that do not currently assess the precision of their age readings over time should do so by re-ageing a subset of their historical samples.

Low

- Evaluate the potential impacts of climate change on tautog range, life history, and productivity.
- Conduct a tag retention study to improve return rates, particularly in the northern region.
- Define the status (condition and extent) of optimum or suitable juvenile habitats and trends in specific areas important to the species. It is critical to protect these habitats or to stimulate restoration or enhancement, if required.
- 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. This information is required to protect these areas from damage and overuse or excessive exploitation.

- 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.
- Define the role of prey type and availability in local juvenile/adult population dynamics over the species range. This information can explain differences in local abundance, movements, growth, fecundity, etc. 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 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.
- Define the susceptibility of juveniles to coastal/anthropogenic contamination and resulting effects. This information can explain differences in local abundance, movements, growth, fecundity, and serve to support continued or increased regulation of the inputs of these contaminants and to assess potential damage. Since oil spills seem to be a too frequent coastal impact problem where juvenile tautog live, it may be helpful to conduct specific studies on effects of various fuel oils and typical exposure concentrations, at various seasonal temperatures and salinities. Studies should also be conducted to evaluate the effect of common piling treatment leachates and common antifouling paints on YOY tautog. The synergistic effects of leaked fuel, bilge water, treated pilings, and antifouling paints on tautog health should also be studied.
- Define the source of offshore eggs and larvae (in situ or washed out coastal spawning).
- Confirm that tautog, like cunner, hibernate in the winter, and in what areas and temperature thresholds, for how long, and if there are 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.

8.4 Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Collect data to assess the magnitude of illegal harvest of tautog and the efficacy of the tagging program.

Low

- Collect basic sociocultural data on tautog user groups including demographics, location, and aspects of fishing practices such as seasonality.

Figures & Tables

Figure 1. Estimated spawning stock biomass, with target and threshold levels, for MARI region.
 Source: 2016 ASMFC Tautog Stock Assessment Update.

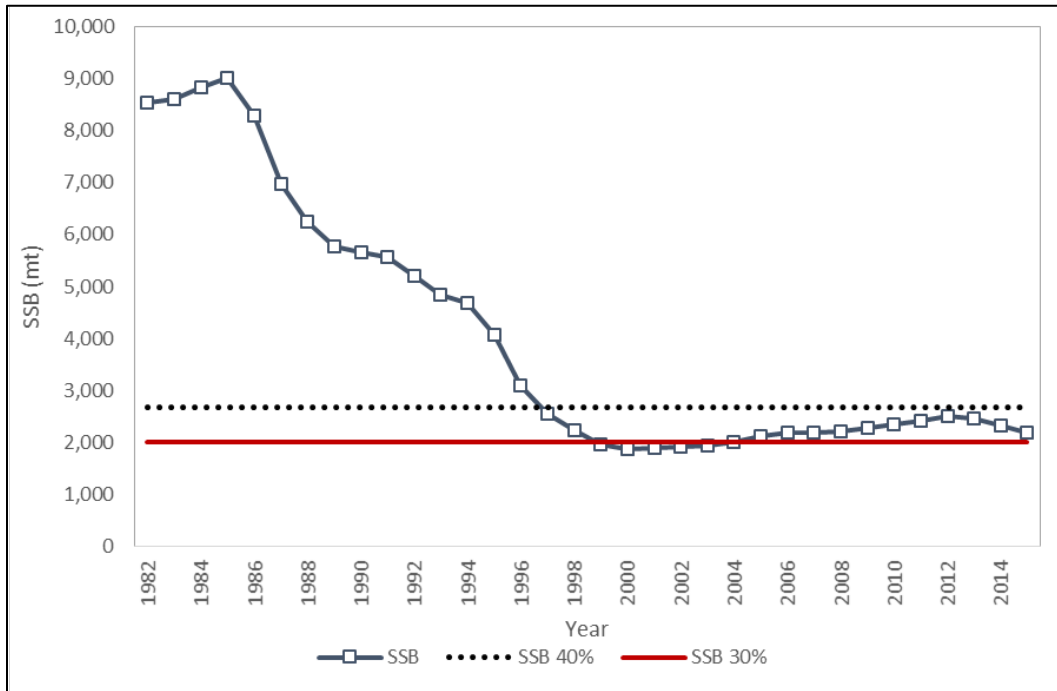


Figure 2. Estimated spawning stock biomass, with target and threshold levels, for LIS region.
 Source: 2016 ASMFC Tautog Stock Assessment Update.

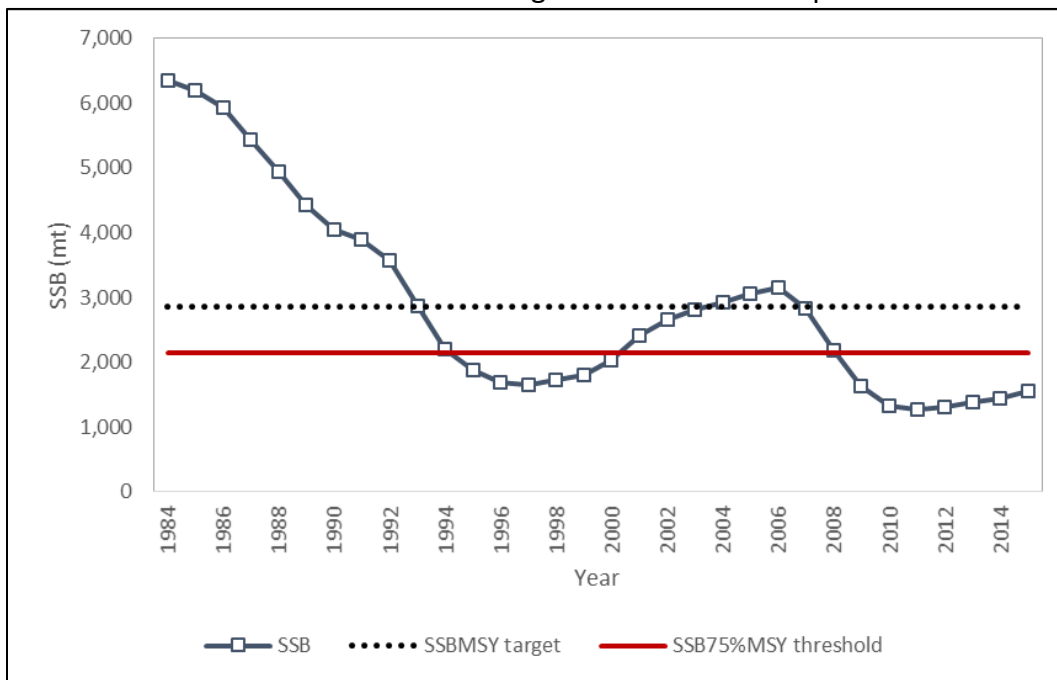


Figure 3. Estimated spawning stock biomass, with target and threshold levels, for NJ-NYB region.
 Source: 2016 ASMFC Tautog Stock Assessment Update.

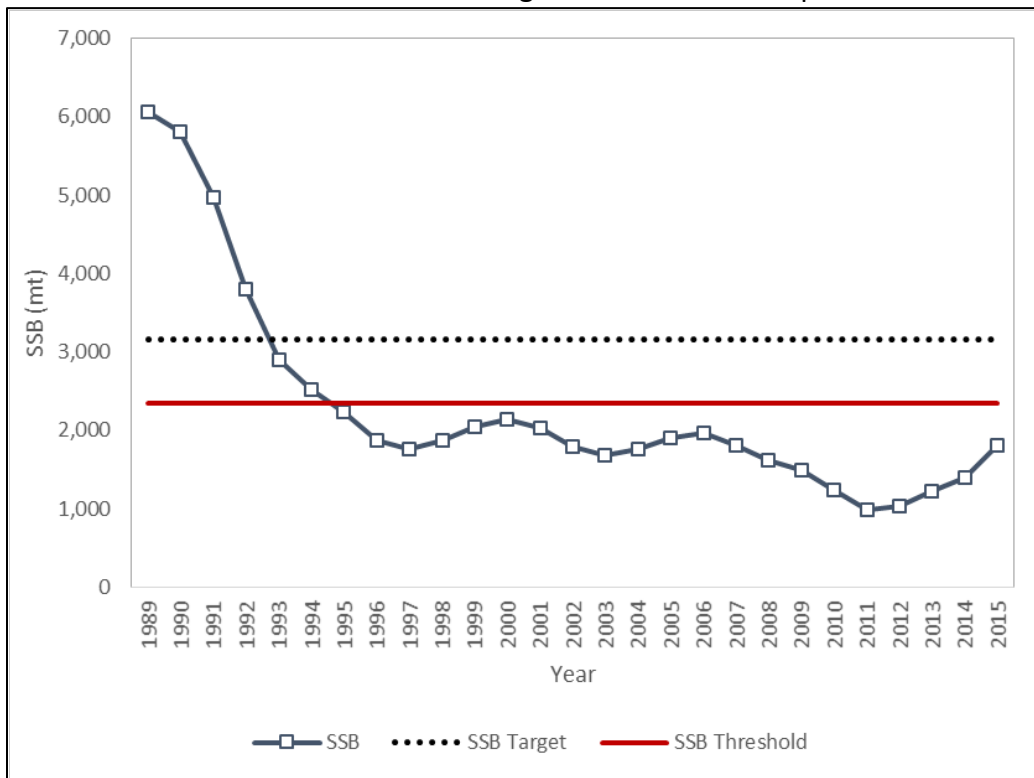


Figure 4. Estimated spawning stock biomass, with target and threshold levels, for DelMarVa region.
 Source: 2016 ASMFC Tautog Stock Assessment Update.

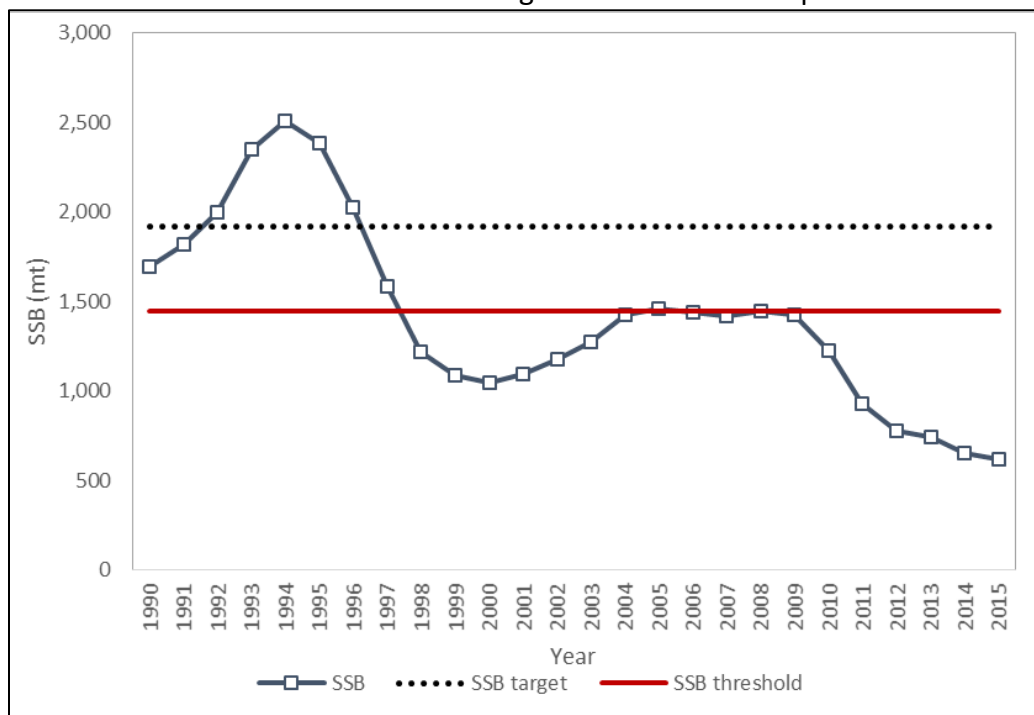


Figure 5. Total tautog harvest (recreational and commercial), 1981–2018.

Source: NMFS, MRIP.

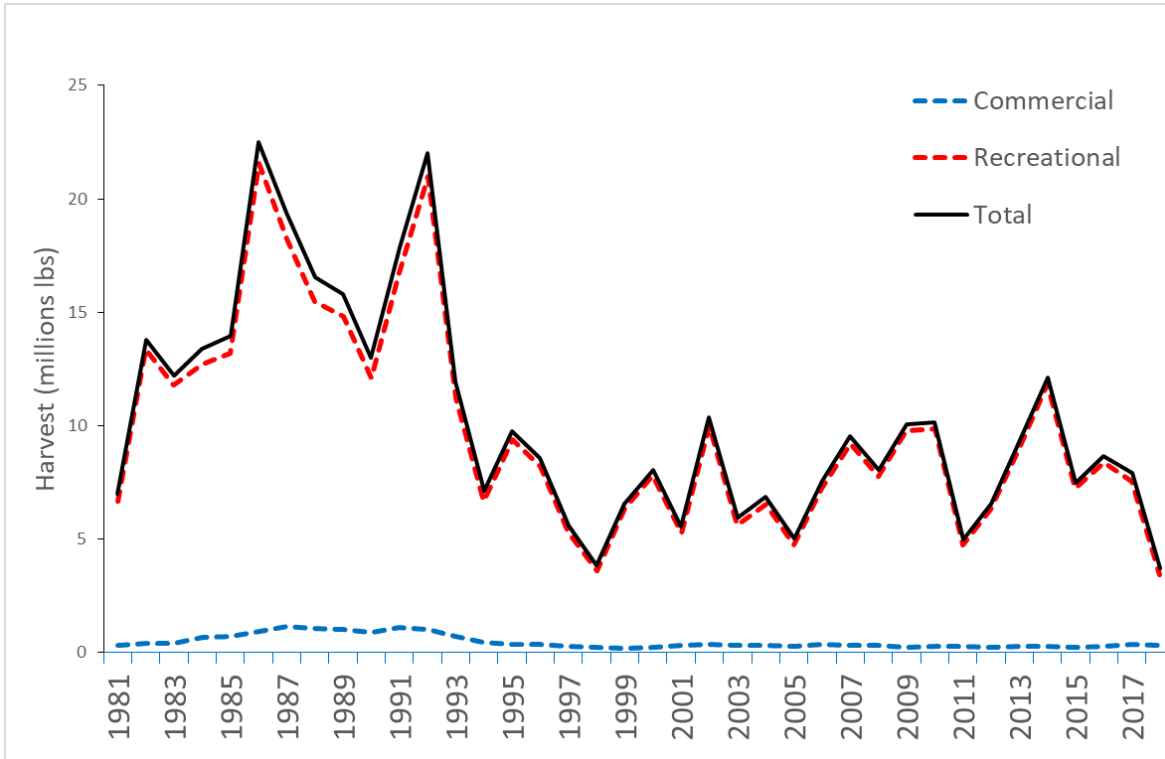


Figure 6. Percent of annual recreational tautog harvest by wave (2016-2018). Source: MRIP.

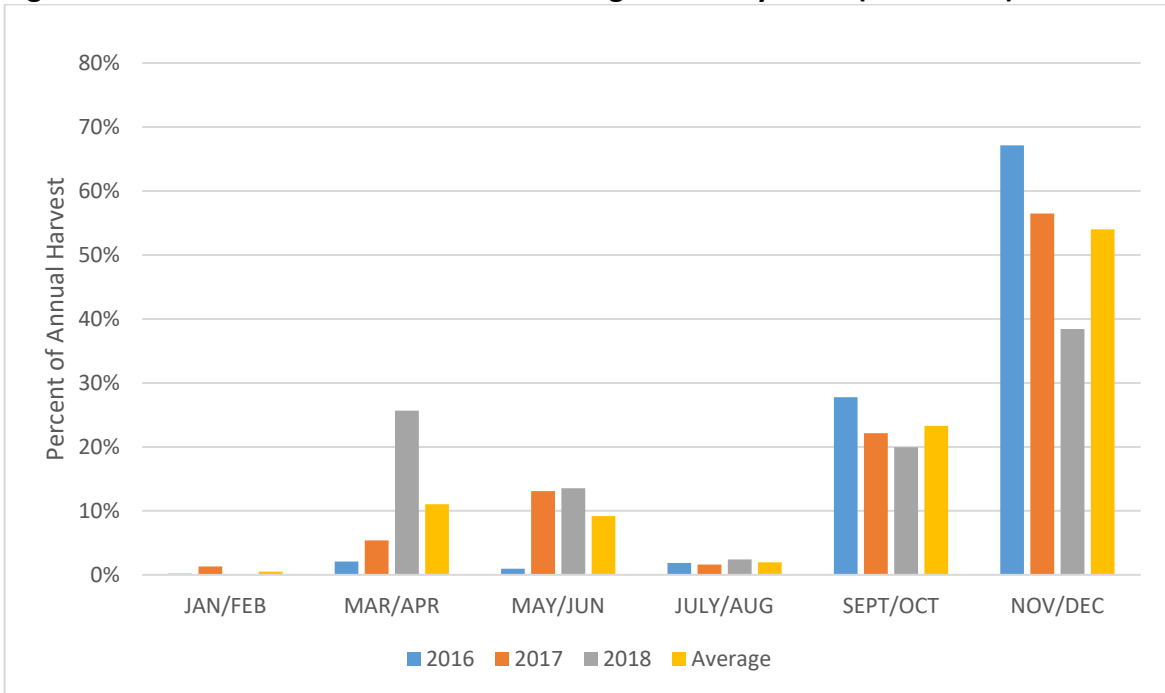


Figure 7. Percent of annual recreational tautog harvest by state (2016-2018). Source: MRIP

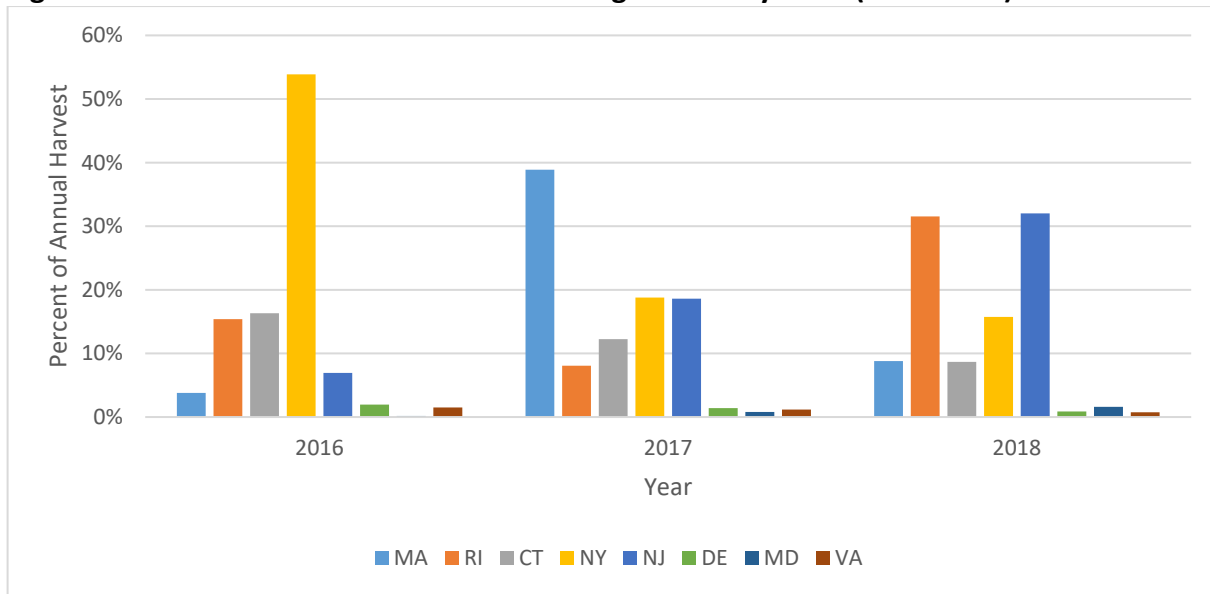


Figure 8. Changes in tautog commercial landings (lbs) and price (\$/lb) over time, 1950–2018. Source: NMFS. Price unadjusted for inflation.

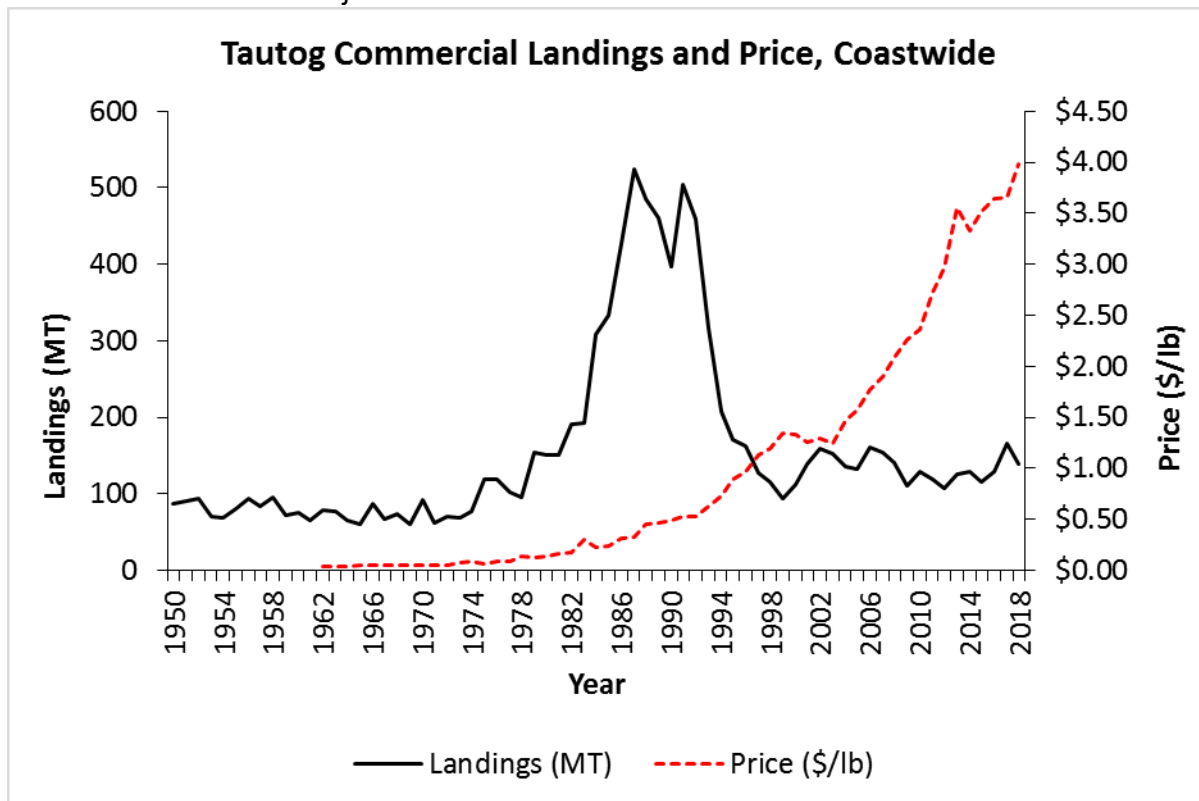


Table 1. Current fishing mortality and biomass targets and thresholds for each region, and stock status in 2015. Source: ASMFC 2016 Tautog Assessment Update.

Region	F_{target}	F_{threshold}	F_{3yravg}	SSB_{target}	SSB_{threshold}	SSB₂₀₁₅	MSY or SPR	Status
MARI	0.28	0.49	0.23	2,684 mt	2,004 mt	2,196 mt	SPR	Not overfished, overfishing not occurring
LIS	0.28	0.49	0.51	2,865 mt	2,148 mt	1,603 mt	MSY	Overfished, overfishing
NJ-NYB	0.20	0.34	0.54	3,154 mt	2,351 mt	1,809 mt	SPR	Overfished, overfishing
DelMarVa	0.16	0.24	0.16	1,919 mt	1,447 mt	621 mt	SPR	Overfished, overfishing not occurring

Table 2. Tautog recreational and commercial landings, 1981–2018, in pounds.

Source: State Compliance Reports, NMFS, and ACCSP Data Warehouse.

Year	Commercial Landings (lbs)	Recreational Harvest, A + B1 (lbs)	Total Harvest (lbs)	% Recreational
1981	331,900	6,657,814	6,989,714	95.3
1982	419,556	13,352,817	13,772,373	97.0
1983	425,519	11,781,286	12,206,805	96.5
1984	677,615	12,730,550	13,408,165	94.9
1985	734,370	13,214,787	13,949,157	94.7
1986	940,806	21,574,556	22,515,362	95.8
1987	1,157,100	18,245,557	19,402,657	94.0
1988	1,070,814	15,491,783	16,562,597	93.5
1989	1,016,431	14,795,435	15,811,866	93.6
1990	873,505	12,113,635	12,987,140	93.3
1991	1,110,111	16,749,359	17,859,470	93.8
1992	1,012,172	21,005,700	22,017,872	95.4
1993	698,440	11,233,660	11,932,100	94.1
1994	459,490	6,655,117	7,114,607	93.5
1995	375,567	9,398,724	9,774,291	96.2
1996	357,434	8,218,590	8,576,024	95.8
1997	280,912	5,314,384	5,595,296	95.0
1998	254,186	3,611,576	3,865,762	93.4
1999	207,981	6,350,388	6,558,369	96.8
2000	247,177	7,795,564	8,042,741	96.9
2001	305,193	5,249,781	5,554,974	94.5
2002	350,820	9,998,665	10,349,485	96.6
2003	336,685	5,630,853	5,967,538	94.4
2004	300,749	6,546,309	6,847,058	95.6
2005	289,984	4,755,445	5,045,429	94.3
2006	355,504	7,219,077	7,574,581	95.3
2007	340,925	9,189,558	9,530,483	96.4
2008	310,940	7,758,609	8,069,549	96.1
2009	243,644	9,801,365	10,045,009	97.6
2010	286,081	9,863,150	10,149,231	97.2
2011	263,241	4,740,790	5,004,031	94.7
2012	236,974	6,315,699	6,552,673	96.4
2013	275,839	9,017,101	9,292,940	97.0
2014	282,624	11,831,114	12,113,738	97.7
2015	255,915	7,246,071	7,501,986	96.6
2016	283,906	8,392,901	8,676,807	96.7
2017	364,736	7,546,839	7,911,575	95.4
2018	309,568	3,413,926	3,723,494	91.7
Average	474,853	9,758,119	10,232,927	95

Table 3. 2018 tautog landings by sector: percent recreational and commercial by weight.

State	Commercial Landings (%)	Recreational (A+B1) (%)
MA	16.9	83.1
RI	4.6	95.4
CT	2.4	97.6
NY	25.8	74.2
NJ	0.1	99.9
DE	1.0	99.0
MD	0.5	99.5
VA	16.7	83.3
NC	2.2	97.8
Coastwide	8.3	91.7

Table 4. Tautog recreational harvest (A+B1) by state and coastwide discards, in number of fish, 1981-2018.

Source: MRFSS/MRIP (calibrated estimates), queried July 11, 2019. *indicates PSE above 50

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Coastwide Harvest	Live Discards	Dead Discards
1981	102,070*	704,618	178,819	1,221,708	238,233*	9,578*	623*	333,400*	16,236*	2,805,285	682,377	17,059
1982	1,214,730	595,042	402,784	942,912	624,103	194,937	92,693*	391,278	21,023*	4,479,502	509,584	12,740
1983	691,922	730,507	344,717	823,426	1,758,296	13,420	3,929*	968,723	30,009	5,364,949	1,535,496	38,387
1984	629,491	675,421	682,458	837,951	2,747,894*	8,685	26,662*	509,701	NA	6,118,263	1,174,842	29,371
1985	116,723	403,944*	290,547	2,630,603	1,769,597	38,875	631*	681,972*	30,989*	5,963,881	1,696,927	42,423
1986	1,670,662	945,557	681,444	1,704,705	2,490,421	152,270	5,108*	778,796	16,004*	8,444,967	1,650,569	41,264
1987	1,113,866	273,398	604,411	1,424,534	3,275,152*	298,648	187,281*	239,543	4,329*	7,421,162	3,189,571	79,739
1988	1,443,548	495,537	413,126	1,703,617	1,223,636	163,119	31,257*	287,857	7,307*	5,769,004	2,515,852	62,896
1989	501,239	373,955	770,503	898,115	2,045,556	502,012	79,803*	589,848	25,312	5,786,343	2,230,076	55,752
1990	836,670	342,916	198,883	1,723,456	1,596,558	117,163	52,384	429,190*	8,275*	5,305,495	2,839,700	70,993
1991	389,000	1,105,100	276,495	1,467,713	1,713,382	183,576	60,483	558,668*	9,821	5,764,238	4,195,634	104,891
1992	1,533,134	764,459	507,384	791,396	2,198,641	118,276	173,944*	308,968*	11,993*	6,408,195	3,520,928	88,023
1993	475,757	235,964	414,334	633,942	1,521,542	233,449	77,140*	782,635	6,685*	4,381,448	3,803,124	95,078
1994	128,738	174,771	444,155	427,604	307,241	95,735	295,465	324,785	2,107	2,200,601	2,842,223	71,056
1995	148,722	114,142	233,762	195,001*	1,311,043	408,528	127,394*	622,205	5,954	3,166,751	3,815,969	95,399
1996	216,698	143,609	150,523	122,153	1,186,204	116,010	72,805*	636,163	8,714	2,652,879	3,196,688	79,917
1997	78,669	174,516	83,153	156,487	573,479	117,773	193,521	161,549	15,008	1,554,155	2,443,651	61,091
1998	81,038	122,830	110,246	149,594	24,693	149,391	16,252*	183,083	17,145*	854,272	3,030,403	75,760
1999	302,890	191,287	44,581*	407,886	279,728	267,875	23,468*	77,898	9,450	1,605,063	5,413,107	135,328
2000	347,448	152,459	68,080*	203,145*	986,483	188,453	63,231*	40,542	21,359	2,071,200	3,531,333	88,283
2001	246,811*	86,818	51,941	118,267	819,588	69,987	57,984*	39,132	7,702	1,498,230	4,264,960	106,624
2002	232,803	177,095	180,753	1,239,615	501,980	274,966	55,339	69,301	6,812*	2,738,664	6,330,432	158,261
2003	95,969	328,392	337,867	245,762	215,920	100,802	18,223*	126,406	12,647	1,481,988	4,033,017	100,825
2004	39,975*	281,619*	30,930	471,302	238,123	163,916	18,286*	455,060	15,830*	1,715,041	3,854,919	96,373
2005	155,754	311,966	75,848	153,333	110,308	98,542	63,320	165,204	27,090*	1,161,365	3,618,496	90,462
2006	102,739	234,043	361,978	265,746	406,800	169,411	34,482*	207,062	2,389*	1,784,650	5,027,287	125,682
2007	67,432*	234,152	544,712	509,816	624,915	203,846	118,459	155,012	36,673*	2,495,017	6,694,584	167,365
2008	72,171*	288,487	244,689	577,628	440,588	162,604	45,166	208,062	967*	2,040,362	5,771,440	144,286
2009	66,280	396,835	356,881	690,545	420,012	324,157	107,289	196,142	6,467*	2,564,608	7,232,074	180,802
2010	153,978	369,830	274,246	540,667	716,531	182,090	289,634	323,725	11,873*	2,862,574	8,169,876	204,247
2011	173,101	79,060*	42,289	322,704	313,745	117,938	64,295*	153,066	3,010*	1,269,208	6,386,822	159,671
2012	96,356	341,478	411,072	302,811	92,340	95,299	20,018*	66,343*	51,956*	1,477,673	8,150,037	203,751
2013	239,699	539,788	307,409	472,562	442,786	96,733	22,954	19,721*	17,128	2,158,780	10,173,418	254,335
2014	444,332	238,595	515,824	913,413*	533,299	131,857	1,155*	87,315	9,809*	2,875,599	10,958,633	273,966
2015	188,145*	295,674	389,139	581,203	339,357	29,199	12,442*	24,493	5,158	1,864,810	10,664,826	266,621
2016	73,516	343,780	312,313	1,068,979	190,163	46,330	3,775*	39,759*	7,510*	2,086,125	13,456,497	336,412
2017	635,994	140,778	218,506	405,691	568,940	32,315	18,741	22,259*	29,559*	2,072,783	13,652,738	341,318
2018	77,951	330,372*	74,530	163,132	385,282	8,927	18,372*	8,186	2,589*	1,069,341	9,570,073	239,252

Table 5. Tautog recreational harvest (A + B1) by state in pounds, 1981-2018.

Source: MRFSS/MRIP (calibrated estimates), queried July 11, 2019. *indicates PSE above 50

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	316,767	2,253,015	444,759	2,043,511	419,174*	34,430*	1,682*	1,132,094*	12,382
1982	3,469,281	2,484,605	1,041,854	2,553,770	1,332,697	409,244	112,822*	1,926,799	21,745
1983	1,777,207	2,001,692	797,211	1,763,109	2,632,185	31,741*	17,117*	2,744,229	16,795
1984	1,989,329	1,894,842	1,977,960	1,599,703	2,714,442	19,196*	69,496*	2,465,582	
1985	274,730	1,055,517*	776,401	5,533,412	3,504,759	49,312	1,527*	1,994,903*	24,226
1986	6,664,034	2,956,799	1,615,028	4,405,989	3,500,911	274,639*	12,124*	2,123,045	21,987
1987	3,057,036	987,308	2,333,325	3,855,404	5,647,886	987,945	306,013*	1,061,763	8,877
1988	5,091,638	1,314,725	1,104,356	4,302,524	2,208,915	349,799	122,122*	994,443	3,261
1989	2,409,824	948,232	2,058,110	2,001,204	3,442,316	2,081,738	196,281*	1,599,363	58,367
1990	3,033,484	917,651	513,870	4,135,800	2,329,494	319,297	94,109	759,668	10,262
1991	1,762,192	3,755,122	901,432	4,106,211	3,702,498	538,411	221,137	1,724,672*	37,684
1992	7,531,141	2,663,107	1,909,770	2,371,795	5,067,709	411,895	293,519*	733,913	22,851
1993	1,669,945	774,926	1,320,472	1,866,328	2,430,109	767,054	161,814	2,222,192	20,820
1994	529,595	748,608	1,294,708	925,451	397,187	242,964	397,926	2,113,405	5,273
1995	650,506	467,400	803,174	548,974*	3,250,236	1,094,687	491,518*	2,077,822	14,407
1996	1,039,911	659,785	490,239	291,482	2,681,850	350,297	98,324*	2,579,379	27,323
1997	308,098	666,065	215,724	749,252*	1,712,208	440,518	497,161	644,872	80,486
1998	310,600	605,908	391,933	485,810	70,731*	659,866	69,541*	972,295	44,892
1999	1,489,331	788,279	153,339*	1,509,978	895,556	1,049,562	42,003*	402,028	20,312
2000	1,301,437	689,698	256,201*	662,491*	3,756,593	692,466	161,426*	241,231	34,021
2001	1,052,175*	392,503	205,109	506,301	2,502,115	240,770	168,595*	168,103	14,110
2002	994,467	743,409	811,658	4,428,842	1,530,757	948,850	140,672	385,679	14,331
2003	527,044	1,388,657	1,180,217	875,271	639,109	358,999	59,071	573,623	28,862
2004	213,380*	1,590,436*	144,278	1,687,077	639,685	563,332	41,259*	1,624,091	42,771
2005	744,036	1,575,454	290,848	566,375	333,101	357,682	167,633	663,938	56,378
2006	484,094	1,130,146	1,589,614	1,002,049	1,443,680	599,179	106,148*	858,131	6,036
2007	260,548*	1,173,787	2,109,801	1,923,067	2,073,632	598,291	270,530	622,935	156,967
2008	230,549*	1,385,061	1,077,399	2,238,161	1,261,010	575,319	119,209	870,249	1,652
2009	236,974	1,648,614	1,353,957	3,057,551	1,273,529	1,034,484	277,124	892,873	26,259
2010	506,622	1,933,773	1,073,576	1,818,920	1,864,817	464,859	920,773	1,246,454	33,356
2011	803,546	328,959*	137,565*	1,284,037	1,008,756	380,758	189,361*	604,361	3,447
2012	403,108	1,512,425	2,093,847	1,285,933	312,531	341,015	62,097*	252,111*	52,632
2013	860,594	2,602,962	1,290,726	2,207,750	1,530,776	341,896	81,662	75,449*	25,286
2014	1,623,717	1,017,780	2,274,293	4,188,165*	1,849,045	485,332	3,544*	365,657*	23,581
2015	1,041,058*	1,105,259	1,594,233	2,153,150	1,100,117	100,302	45,067*	100,143*	6,742
2016	317,006	1,290,428	1,368,363	4,514,164	582,199	164,887	15,059*	126,135*	14,660
2017	2,883,890	599,424	908,549	1,394,388	1,380,992	103,331	59,901*	88,228*	128,136
2018	300,067	1,075,131*	295,758	536,332	1,091,046	30,240	54,332*	25,766	5,254

Table 6. Commercial landings for tautog in pounds, by state, 1981-2018.

Source: ACCSP Data Warehouse and State Compliance Reports.

*2018 Landings data are preliminary and subject to change.

Year	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	N/A
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	N/A	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	confid
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	1,134
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	1,599	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	confid	6,489	20,901	728
2000	96,001	43,719	8,504	39,953	39,636	confid	3,896	14,794	674
2001	84,330	56,065	22,259	62,795	60,152	confid	4,591	14,587	414
2002	148,073	50,007	26,781	60,805	36,605	confid	5,010	22,834	705
2003	86,205	54,650	40,784	72,264	66,766	confid	5,213	10,705	98
2004	88,192	36,581	26,037	76,606	51,057	3,064	6,049	13,079	84
2005	99,344	42,838	24,053	52,525	61,163	confid	4,338	5,667	56
2006	147,609	47,261	16,841	71,683	58,119	confid	5,411	8,533	47
2007	95,820	63,441	30,002	73,797	62,979	2,814	3,297	8,588	187
2008	73,867	48,027	20,160	88,571	63,958	2,253	2,964	10,946	194
2009	54,703	50,920	21,194	87,289	14,591	2,116	1,638	11,132	61
2010	75,317	44,054	16,948	93,153	49,213	confid	1,285	6,077	34
2011	57,787	47,426	14,784	82,761	45,865	confid	confid	14,590	28
2012	67,870	50,126	6,233	76,373	20,831	1,444	confid	13,870	227
2013	70,157	53,428	5,887	110,849	22,079	confid	1,458	11,776	205
2014	63,191	53,384	5,164	121,538	31,665	confid	confid	7,545	137
2015	61,752	47,140	7,249	111,925	17,538	2,107	1,173	6,937	94
2016	58,095	50,680	7,651	144,650	13,367	2,083	1,098	6,252	30
2017	66,481	52,844	8,485	171,508	confid	confid	confid	5,165	116
2018*	61,055	51,414	7,341	186,109	1,559	306	273	1,402	109

Table 7. State recreational regulations implemented for Tautog in the 2018 fishing year.

STATE	SIZE LIMIT (inches)	POSSESSION LIMITS (fish/person/day)	OPEN SEASONS (dates inclusive)
Massachusetts	16"	3 1 5 (10 fish/day/vessel max for private/rental mode)	Apr 1-May 31; Aug 1-Oct 14 Jun 1-Jul 31 Oct 15-Dec 31
Rhode Island	16"	3 3	Apr 15 – May 31 Aug 1 – Oct 14
		5 (10 fish/day/vessel max for private/rental mode)	Oct 15 – Dec 31
Connecticut	16"	2 2 3	Apr 1 – Apr 30 July 1 – Aug 31 Oct 10 – Nov 23
New York	16"	LIS: 2 LIS: 3	Apr 1- Apr 30 Oct 11-Dec 9
		NY Bight: 2 NY Bight: 4	Apr 1- Apr 30 Oct 15-Dec 22
New Jersey	15"	4 1 5	Jan 11 – Feb 28 Apr 1 – Apr 30 Aug 1 – Nov 15 Nov 16 – Dec 31
Delaware	16"	4	Jan 1 – May 15 Jul 1 – Dec 31
Maryland	16"	4 2	Jan 1- May 15 Jul 1 – Oct 31
		4	Nov 1 – Dec 31
Virginia	16"	3	Jan 1 – Apr 30 Sep 20 – Dec 31

Table 8. State commercial regulations implemented for Tautog in the 2018 fishing year.

STATE	SIZE LIMIT	POSSESSION LIMITS (number of fish)	OPEN SEASONS	QUOTA (pounds)	GEAR RESTRICTIONS
Massachusetts	16"	40	Sept 1 – 100% of Quota	62,945*	Mandatory pot requirements. Limited entry and area/time closures for specific gear types. Fishery permit endorsement
Rhode Island	16"	10	Apr 1 – May 31 Oct 15 – Dec 31	49,888**	Harvest allowed by permitted gear types only.
Connecticut	16"	3 (restricted licenses) 10 (all other)	Apr 1 – Apr 30 Jul 1 – Aug 31 Oct 8 – Dec 24	-	Mandatory pot requirements.
New York	15"	25 (10 fish w/ lobster gear and when 6 lobsters are in possession)	LIS: May 7 – July 31; Sept 1- Nov 23 NY Bight: Apr 18 –Jan 25	-	Mandatory pot requirements. Gill or trammel net is prohibited.
New Jersey	15"	> 100 lb requires directed fishery permit	Jan 1 – May 1 Sept 19-Dec 31	103,000	Mandatory pot requirements.
Delaware	16"	4	Jan 1 – May 15 July 1 – Dec 31	-	Mandatory pot requirements.
Maryland	16"	4 2 4	Jan 1-May 15 July 1 – Oct 31 Nov 1- Dec 31	-	Mandatory pot requirements.
Virginia	15"	-	Jan 1 – Jan 21 Mar 1 – May 15 Nov 1 – Dec 31	-	Mandatory pot requirements. Pots prohibited in tidal waters.

* Massachusetts' quota adjusted for overage in 2017 from a base quota of 64,753 lbs.

** Rhode Island's quota of 51,348 lbs is divided equally among the three sub-periods.

Table 9. Number of age/length samples by state in 2018. Addendum III requires all states to collect 200 samples per year. Source: State compliance reports

State	2018 Samples	Sample Sources
MA	1105 lengths; 244 otoliths, 255 spines	Commercial Fishery Market sampling; Fishery independent rod and reel, and trawl surveys, ventless trap survey for Lobster
RI	219 lengths; 217 ages	Recreational fishery sampling, RIDMF Fish Pot Survey, RIDMF Trawl Survey
CT	201 ages	Long Island Sound Trawl Survey
NY	832 lengths; 148 ages	Commercial markets sampling; fishery independent surveys
NJ	359 lengths and ages	Recreational fishery; NJ Ocean Trawl Survey and Artificial Reef Ventless Trap Survey
DE	134 otoliths	Recreational sampling
MD	243 lengths and 211 otoliths	Recreational sampling
VA	26 lengths and ages	Marine Sport Fish Collection Project

Table 10. Ongoing fishery-independent surveys, as of 2018. Shaded cells indicate survey data used in 2016 stock assessment.

State	Areas Surveyed	Survey Type	# of Survey Stations	Dates of Survey	Initial Year
MA	MA territorial waters	Trawl	1 station per 19 square nautical miles	May and September	1978
	Buzzards Bay, south of the Elizabeth Islands, and portions of Rhode Island Sound	Trap	42 stations twice per month	June through September	2015
	Buzzards Bay and Vineyard Sound	Rod & Reel	48 stations per month	Spring (Apr-May) Fall (Sep-Nov)	2016 (fall)
RI	Narragansett Bay	Trawl	13 stations per month	June through October	1990
	Narragansett Bay, Rhode Island Sound and Block Island Sound	Trawl	44 stations	Spring (April-May) Fall (Sept/October)	1979
	Narragansett Bay Beach	Seine	18 stations per month	June through October	1988
	Coastal Ponds	Seine	24 stations in 8 coastal ponds per month	May through October	1994
	Narragansett Bay	Trap	10, 5 pot trawls set per month	April through October	2013
CT	Long Island Sound (CT and NY waters)	Trawl	40 stations per month	Spring (April-June) Fall (Sept-Oct)	1984
NY	Peconic Bay	Trawl	16 stations per week	May through October	1987
	Western Long Island (Little Neck, Manhasset Bay, Jamaica Bay)	Seine	5-10 sites, semimonthly	May through October	1984
	Long Island Sound	Trap	35 stations per week	May through October	2007
NJ	Nearshore ocean waters between Cape May and Sandy Hook	Trawl	30 tows in Jan; 39 tows per month in Apr, Jun, Aug & Oct	Jan, Apr, June, Aug & Oct	August 1988
DE	Fisheries independent surveys do not collect tautog in quantities needed for monitoring purposes				NA
MD	Maryland Coastal Bays	Trawl	20 stations per	April through October	1989
		Seine	19 stations per month	June, September	1989
	Submerged Aquatic Habitat in Sinepuxent Bay	Seine	5 zones	September only	2015
VA	Fisheries independent surveys do not collect tautog in quantities needed for monitoring purposes				NA

Table 11. Ongoing fishery-dependent monitoring in each state, as of 2018

State	Fishery Sector	Data Collected	Data Source
MA	Commercial	Landings at the trip level	Harvesters and primary buyers
	Commercial	Length	Market sampling
RI	Recreational	Age, Length	Recreational harvest sampling
	Commercial	Age	Fish Pot Survey
CT	Commercial	Monthly landings	Harvesters and dealers
NY	Commercial	Age, Length	Markets and dockside sampling
NJ	Commercial	Age, Length, Weight, Sex	Commercial vessel sampling
	Recreational	Age, Length, Sex	Party/charter boat sampling (retained fish)
DE	Commercial	Landings	Monthly harvester logbooks
	Recreational	Age, Length	Recreational harvest sampling
MD	Recreational	Age, Length, Weight, Sex	Charter boat hook and line sampling
	Commercial	Landings	Harvest reports
VA	Commercial	Age, Length, Weights	Samples from commercial hook-and-line gear, haul seines, pots/traps, pound nets
	Recreational	Age, Length, Weights	VMRC Marine Sport Fish Collection Project
		Tagging data	Game Fish Tagging Program

*Surveys as part of MRIP occur in all states and are not included in the table. Commercial landings monitoring by the Standard Atlantic Fisheries Information System (SAFIS) is also excluded.